

## Inside Dope

By GEORGE  
F. TAUBENECKLearn to live and laugh —  
thus delay your epitaph

## Stories of the Week

## Wonderful Idea

Happy New Year,  
Everybody!

## Thoughts for Scientists

## Stories of the Week

Kathy and Mary Jo, sisters, were allowed to stay up past midnight New Year's Eve. Mary Jo climbed into bed quickly.

"Aren't you going to say your prayers?" Kathy was shocked.

"I wouldn't dream," Mary Jo sweetheated, "of waking God up at this late hour."

If we keep on firing stuff into space, probably the first message we'll hear from OUT THERE will be (even if we don't understand the language):

"Hey, cut it out down there, you Earthians."

Sign observed in a Dayton, Ohio, food store:

"We now carry frozen ice cubes."

## Wonderful Idea

1957 marks the 7th year that Wolverine Tube has given a contribution to the Free Press Fresh Air Camp Fund in behalf of its customers, according to Hi Harty. In this way, Wolverine's customers receive a "gift they cannot see," and provide children with a camp experience they would never be able to enjoy otherwise.

It all started in 1951, when Wolverine decided that the best gift their customers could receive would be the knowledge that they played a part in sending some underprivileged youngsters to camp the following summer. This year's gift will allow some 250 children to attend the Free Press Fresh Air Camp next summer.

Happy New Year,  
Everybody!

"Dope" is a cooperative enterprise. Suggestions and contributions from subscribers keep this column alive. We salute you, contributing subscribers! And thank you heartily.

Herewith a year-end close-out of letters-to-Dope:

General Motors Overseas  
Operations  
Div. of General Motors Corp.  
Detroit 2, Mich.

Editor:

Knowing that you will appreciate a new approach to an old problem, namely, one of getting prompt service overseas, I

(Concluded on Page 5, Col. 1)

## '58 Remington Room Unit Line Offers 8 Series

### 230-Volt Units Convert To 208 V. Without Loss

AUBURN, N. Y. — Eight series of room air conditioners for 1958 were announced recently by the air conditioning division of Remington Corp.

The low-end "El Dorado" series contains a  $\frac{3}{4}$ -hp. and two 1-hp. units, the "Mighty-Mite" two 1-hp. models, the "Imperial Ultra-Thin" a  $\frac{3}{4}$  and 1-hp. unit, the "Powerhouse" series a  $\frac{1}{2}$  and 2-hp. model, the "Hide-A-Way In-Wall" series two 1-hp., one  $1\frac{1}{2}$ -hp., and one 2-hp. models, the air-cooled console series five models ranging from  $\frac{3}{4}$  to 2 hp., and the water-cooled console series two 1-hp. and a  $1\frac{1}{2}$ -hp. models.

Where two models of the same horsepower rating appear in the same series, one is for 115-volt and the other for 230-volt applications.

All 230-volt models may be equipped with a conversion package with which they will maintain full cooling power and overload capacity on 208-volt circuits, the company said.

Most models will offer both 50 and 60-cycle operation.

In addition, Remington will offer to its export trade in the tropics a special series of units suitable for 50-cycle operation only. These heavy duty units are designed to withstand the most severe temperature conditions.

(Concluded on Page 13, Col. 4)

## Heating Section . . .

"At least half of the failures in our industry at the retail level are caused not by poor selling but by poor purchasing," contends Newton T. Hess. Read about it

... Next Week

## GI's, Brass Watch Army Demonstrations From Air Conditioned Salvage Trailer

By George M. Hanning

FORT BELVOIR, Va. — Remember, you ex-GI's of World War II, how, at training camps, you used to sit on a hillside under a broiling sun—or maybe a little heavy dew—to watch a demonstration of artillery fire, tank maneuvers, or some such?

Well, that's for the birds for here at Fort Belvoir they have the answer.

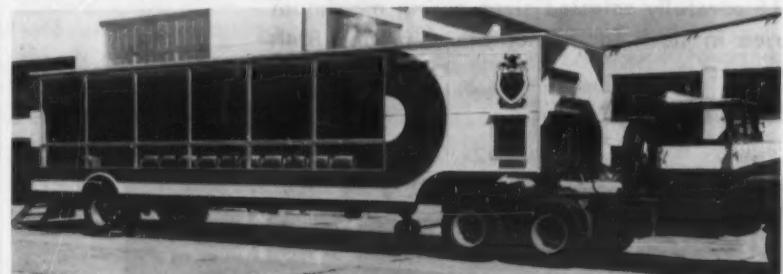
An air conditioned classroom on wheels hauls students at The Engineer School and visiting

dignitaries to the demonstration area.

The classroom is a salvaged CO<sub>2</sub> trailer spruced up and converted to training use. To make room for the refrigeration condensing unit and 15 kw. generator to provide the vehicle with its own power supply, a 5-ft. extension was added to the rear end.

Equipment for the trailer was taken from the stock of training

(Concluded on Page 4, Col. 1)



PINK AND WHITE picture window air conditioned trailer makes watching army field demonstrations a pleasure at Ft. Belvoir, Va.

## At Hussmann

## Stelpflug Drops Sales Duties; Biddle Steps Up

ST. LOUIS — Resignation of William J. Stelpflug as president of Hussmann Refrigeration, Inc., a wholly owned sales subsidiary of Hussmann Refrigerator Co., was announced recently by W. B. McMillan, president and chairman of the board.

Stelpflug's resignation Jan. 1 will enable him to devote full time to long-range planning and other company policies as he continues his posts as senior vice president and a director of Hussmann Refrigerator.

Arthur B. Biddle, executive vice president of the sales subsidiary, will assume charge of Hussmann Refrigeration. No other change of officers in the subsidiary is contemplated.

## See Liberalized FHA Trade-Ins for '58

WASHINGTON, D. C.—Plans by government officials for new housing legislation in 1958 include the following, according to sources in the building field:

An increase in the mortgage insurance ceilings on Federal Housing Administration loans to possibly \$30,000. The ceiling is now \$20,000.

(Concluded on Page 13, Col. 3)

## Heating Section . . .

"At least half of the failures in our industry at the retail level are caused not by poor selling but by poor purchasing," contends Newton T. Hess. Read about it

... Next Week

Issued every Monday at  
450 West Fort St., Detroit 26, Michigan  
Established 1926

Member,  
Associated  
Business  
Publications



Member,  
Audit  
Bureau  
of  
Circulations

## N. Y. Provides for Operating Permits In Refrigeration Code Has No Important Changes from B9.1

NEW YORK CITY—A new refrigeration code for the city of New York was signed into law by Mayor Robert Wagner on Dec. 18 and took effect immediately.

The new code is basically the ASA B9.1-1953 mechanical refrigeration code with provisions added governing permits to operate refrigerating systems, a schedule of annual fees for operators, and certificates of qualification for operating engineers.

No important changes were made in the B9.1 code recommended by the American Standards Association and drawn up by the American Society of Refrigerating Engineers.

But a number of provisions were revised and adapted to the needs of New York City by a special committee on air conditioning and refrigeration of the Commerce and Industry Association of New York, Inc.

Reflecting more than 2½ years of steady, intensive research and study by the special committee, the code actually climaxes a six-year effort to modernize New York City's conglomeration of administrative code provisions.

They were over a quarter of a century out of date, according to Arnold Witte, counsel for the Commerce and Industry Association.

Early efforts met solid opposition (Concluded on Page 13, Col. 1)

## Waterman-Waterbury Ups Dervey to Chief

MINNEAPOLIS—Ray J. Dervey, formerly executive vice president, has been named president of Waterman-Waterbury Co. here, manufacturer of warm air heating and air conditioning equipment.

He succeeds David Sedgwick, who resigned as president early in December.

Dervey was one of a group of five Twin City business and financial executives who purchased controlling interest in the company last spring. Prior to joining Waterbury, he had (Concluded on Page 4, Col. 5)

... Next Week

## BEHIND PAGE ONE . . .

### 'Information Please' Sessions

Refrigerant, Voltage, Compressors,  
Starting Switches Discussed by Panel..... 6

### Guide To 1957 Stories In the NEWS

Index of Most Significant Stories  
Of Lasting Interest During Year..... 10

### Air Distribution Requirements In Year-Round Air Conditioning..... 12

### Low Voltage Thermostats

Design and Operation..... 15

### Regular Features

Editorial ..... 8 Letters ..... 8

What's New ..... 9 Patents ..... 14

## York Appoints Lloyd Wasson

YORK, Pa.—Lloyd D. Wasson has been named general manager of packaged products for all franchised branches and subsidiaries of York Corp., subsidiary of Borg-Warner, it was announced by Austin Rising, vice president and director of marketing.



L. D. Wasson

Wasson will direct the marketing of York room air conditioners, refrigeration products, and commercial self-contained air conditioners, through the company's franchised subsidiaries in the United States.

Wasson has been with York since 1938, serving as regional commercial sales manager and

president of York Detroit Corp. Since 1947 he has been president and member of the board of directors of York Distributors, Inc.

### 3 Los Angeles Men Win 'Meritorious Service Awards'

SAN FRANCISCO — Three Los Angeles men have been given "meritorious service awards" by the California Apprenticeship Council at its recent meeting for their work in behalf of the Los Angeles refrigeration and air conditioning joint apprenticeship committee, it has been announced.

They are: William J. Robinson of Hugh Robinson & Sons, industrial refrigeration; Henry B. Ely, executive secretary of RACCA of Southern California, an attorney; and Eugene H. Ballard, business manager of refrigeration fitters branch, U. A. local union 250.

## Walter G. Seeger Quits as Chairman Of Whirlpool Corp.

ST. JOSEPH, Mich.—Walter G. Seeger, chairman of the board of directors of Whirlpool Corp., will relinquish this position effective Jan. 1, 1958, it was announced by Elisha Gray II, president.

Seeger will continue as a director. The board of directors has no plans to fill the vacated position, Gray said. Seeger explained that he would "now like to decrease my formal business activity."

Seeger, who joined Seeger Refrigerator Co., St. Paul, Minn. in 1907, was chairman of the board when it merged with Whirlpool Corp. in Sept. 1955. He has been chairman of the board and a director of the new company.

## ARI Issues Standard 240-57 To Cover 'Unitary Heat Pump Equipment'

WASHINGTON, D. C.—Recognizing the growing trend in the development and use of heat pumps, the Air-Conditioning & Refrigeration Institute has issued the first ARI Standard covering "Unitary Heat Pump Equipment."

The new standard, numbered 240-57, was issued to "establish minimum industry standards of performance of unitary heat pumps and to provide means for establishing reliable ratings," it is set forth under Section I, "Purpose."

It applies to factory-made residential, commercial, and industrial heat pumps or matched assemblies as defined in the standard and as manufactured or assembled by a manufacturer.

"Manufacturer" is defined as a person, firm, or corporation

which performs one or more of the following functions: "product engineering, producing in whole or in part, or effecting some substantial physical or functional change in an air conditioning or refrigeration product, including any substantial processing and/or substantial assembling operation."

However, the standard points out, packaging or labeling operations alone do not constitute manufacture, "but manufacturing shall be interpreted as including distribution effort on a product which is sold under the marketer's own trade name and on which product the marketer contributes substantial design, application, and standards engineering."

The standard does not apply to field-modified cooling units which may be converted to heat pump operation, nor to room air conditioners.

It provides that standard ratings relating to cooling capacity shall be stated as total cooling capacity "and expressed only in terms of B.t.u. per hour in multiples of 1,000 B.t.u. per hour," and those relating to heating capacity shall be net values, reflecting the effects of circulating-fan heat, and expressed in the same terms as cooling capacity ratings. If auxiliary heating capacity is included in the rating, "it must also be separately designated in B.t.u. per hour."

Standard 240-57 was prepared by the Heat Pump Sub-Committee of the Self-Contained and Residential Air Conditioner Section of ARI, of which W. L. McGrath of Carrier Corp. is chairman. It is available from ARI at 35 cents per copy.

## Westinghouse Shifts Executive Assignments

NEW YORK CITY — New executive assignments at the policy, administrative, and operations levels of Westinghouse Electric Corp., effective Jan. 1, were announced by Gwilym A. Price, chairman and president.

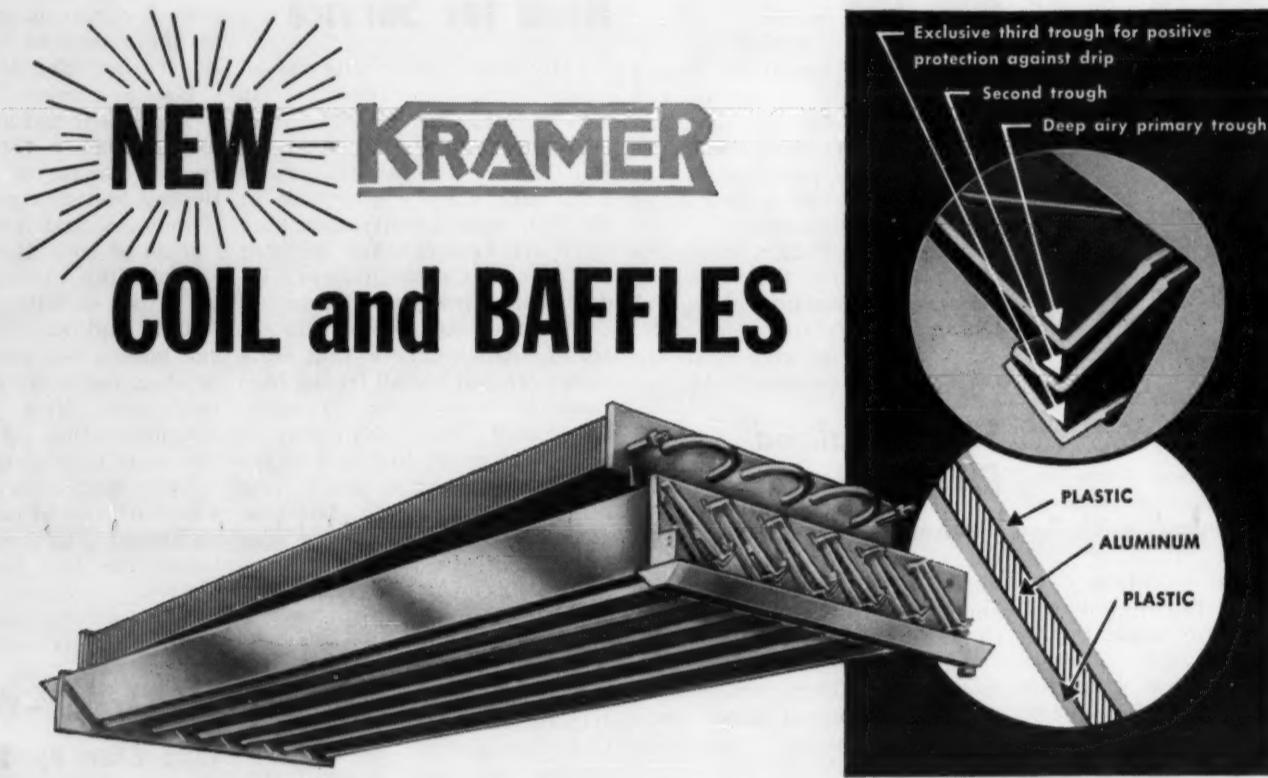
Price, who has been president since 1946 and chairman since 1955, becomes chairman of the board.

Mark W. Cresap, Jr., executive vice president and a director since 1955, was elected president and chief administrative and operating officer.

E. V. Huggins, who has been vice president-corporate affairs and corporate secretary, becomes chairman of the executive committee of the board of directors and vice president.

John K. Hodnette, vice president and general manager and a director of the company since 1955, was elected executive vice president.

George G. Main, treasurer since 1949, retains that position and becomes also vice president-finance. Francis E. Dalton, director, corporate accounting since 1949, was elected controller. Carlisle P. Myers, general counsel since 1955, retains that position and was elected corporate secretary. Russell B. Read, planning director since 1952, will continue in that assignment and was elected assistant treasurer.



with attractive lifetime  
PLASTIC CLAD ALUMINUM  
at no extra cost!

**Permanently Attractive Baffle**—Constructed of a new plastic-clad aluminum which combines the strength and flexibility of aluminum with corrosion-resistant plastic for lifetime beauty. It will not chip, peel, corrode, sag, fade nor get brittle. It is absolutely odorless and sanitary. The coil with its colorful baffle will retain its attractive appearance for the life of the cooler.

**Dripless Triple-Trough Design**—The triple-trough—a unique Kramer feature—provides a deeper primary trough for unrestricted draftless circulation of cool air. The narrow third trough reduces dripping to a minimum, making the Kramer triple-trough baffle virtually drip-proof.

**Easy to Install**—Kramer coil and baffle combinations are completely assembled at the factory. Shipped in closed wooden cases, they arrive on the job clean and ready for installation, saving assembly and installation time.

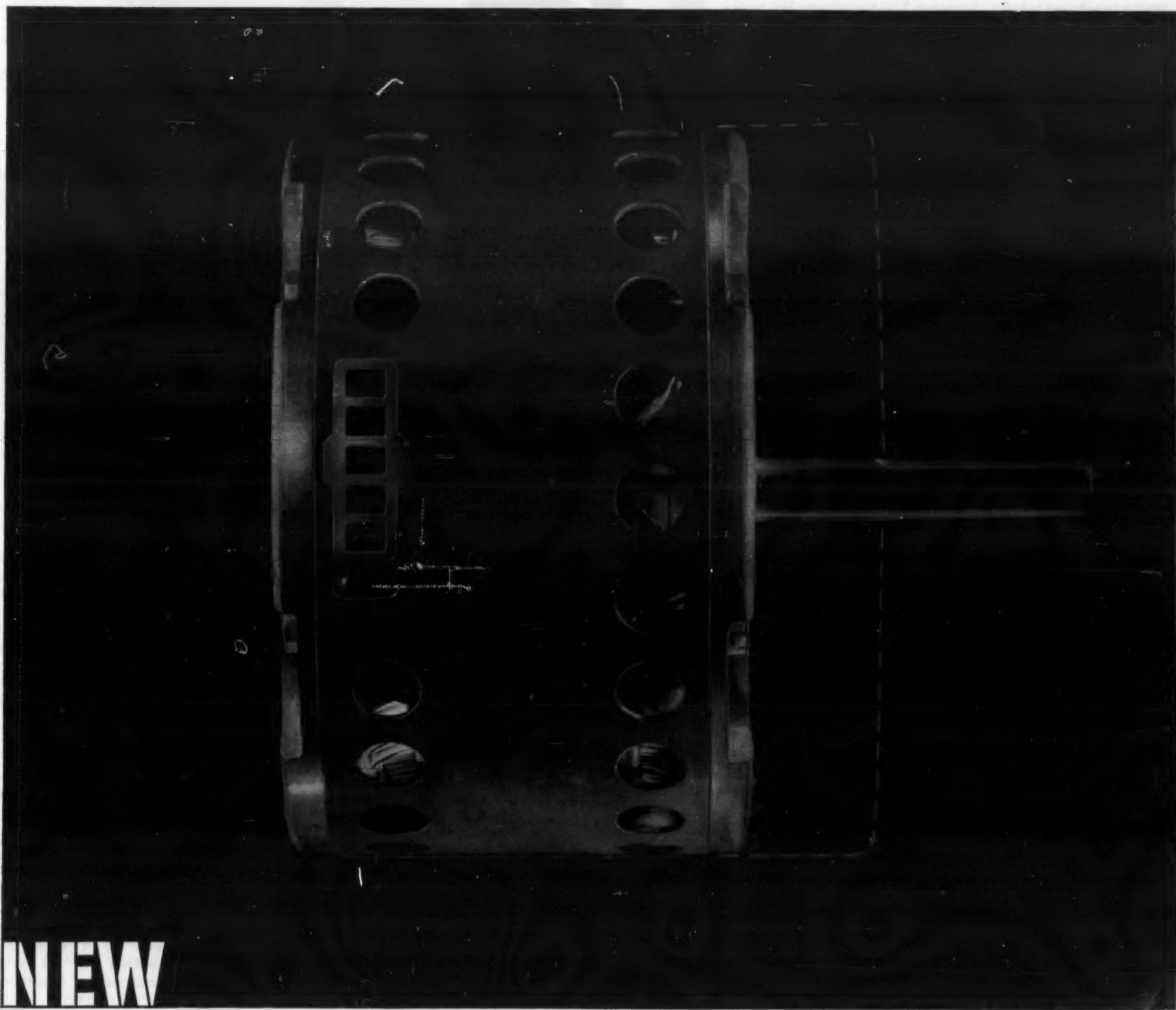
**Immediate Shipment**—A complete range of 15 carefully selected sizes giving maximum Btu per dollar for every application are carried in stock for immediate shipment. Both left-hand and right-hand baffles are available.

WRITE FOR BULLETIN CBC-276C

**KRAMER TRENTON CO. • Trenton 5, N.J.**

44 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER

For more information about products advertised on this page use Information Center, page 9.



**NEW**

## DELCO FAN MOTOR IS SHORTER

### Both shaded pole and permanent split capacitor designs save 20% in length

Delco has cut the size of shaded pole and split capacitor motors. The new designs are only four-fifths the length of previous models.

The new Delco motor is quieter and has a unique lubricating system. The lubricating compound consists of a cellulose carrier combined with a very high percentage of oil. This fluid combination provides superior lubrication under all operating conditions. The new motor can be mounted in any position. The lubricant carrier and efficient enclosure of the lubricant chamber combine to retain the oil effectively regardless of mounting position.

Both motors are available with one or both end frames enclosed and either full or partially ventilated main frames for maximum flexibility in product design. Sizes include 1/15, 1/10, 1/8, 1/6 and 1/4 h.p. in a wide choice of rigid and resilient mountings.

Contact your Delco Products sales office and get all the details on this new, smaller motor. Find out what a great advantage its smaller size can mean in your product.

**MOISTURE RESISTANT INSULATION**  
Insulation components have been improved to offer maximum protection against moisture in high humidity air conditioning applications.

**BUILT-IN TERMINAL BLOCK**—Attachment of leads is fast and easy. Block may be used for one- or two-speed operation.

**RUST RESISTANT THROUGHOUT**—All metal parts are specially treated to resist rust and corrosion.

**BEARINGS**—Full steel backed babbitt bearings are precision bored to exacting tolerances . . . are set in rigid frames to maintain accurate alignment.



### DELCO MOTORS

Delco Products, Division of General Motors, Dayton, Ohio

- APPLIANCE MOTORS • INDUSTRIAL MOTORS
- GENERATORS • ACTUATORS
- AUTOMOTIVE AND HYDRAULIC EQUIPMENT
- HERMETIC MOTORS AND CONTROLS
- RESIDENTIAL GARAGE DOOR OPERATORS
- AIR SUSPENSION COMPONENTS



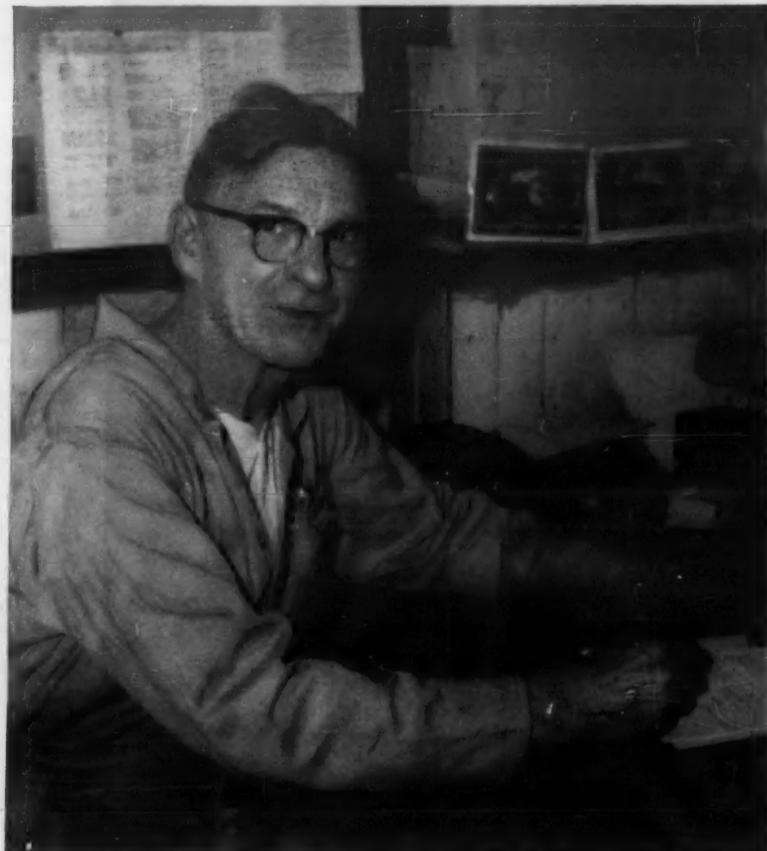
## Air Conditioned Salvage Trailer--

(Concluded from Page 1, Col. 3) is steel on aluminum frame, it was explained.

The trailer, painted a bright pink and white, replaces about eight sets of bleachers and can handle 40 people at one time. Its interior measures 34 ft. long, 9 ft. wide, and 7 1/2 ft. high. It is insulated with 2 in. of "Fiberglas" in roof and walls and is soundproofed. The trailer body rear wall.



CHECKING PERFORMANCE of air handling section of rear of trailer are Robert Trainor, assistant branch chief of the technical equipment branch, Dept. of "Mech and Tech," and Bill Burgard, field engineer for Wilson Supply Co., who supplied the air conditioner.



COL. FRANK POLICH, who conceived the idea of the cooled trailer as a training aid for the Engineers School, poses by the equipment compartment containing condensing unit section of 7 1/2-hp. air conditioner and 15 kw generator.

### CONDITIONED AIR THROWN FULL LENGTH

Fresh air is taken in from behind the plenum and returned from lower front grille. The unit throws conditioned air the full length of the trailer at ceiling height. The air conditioning and strip heaters provide and maintain temperature conditions desired in the trailer.

There are three rows of seats facing the plexiglas picture window along one side. The second and third rows are raised higher than the first so that everyone has a clear view. An emergency exit is built into the wall behind the seats.

At the front end of the trailer, beyond the seats, is a little dais for the instructor. A fold-out speaker's stand gives him a place to rest his notes. A microphone connects with the public address system.

A fluorescent lamp lights his stand overhead. Two rows of fluorescent fixtures provide illumination for his audience. Their auditorium-type seats are equipped with fold-up arm-desks for taking notes.

The speaker's area also includes a hi-fi recorder for playing music or recorded instruction. The speaker also has communication with the driver's cab so he can direct the driver to a particular location or stop as desired.

### CAN DIRECT DEMONSTRATION

Loud speakers mounted beneath the trailer will throw the speaker's voice some 200 yards so that he can direct the demonstration from inside the trailer.

To the speaker's right is a magnetic blackboard installed at ceiling height so all can see it. It can be dropped down to reveal a small plastic movie screen on which filmstrips are shown by rear projection.

### DRIVER HAS ACCESS TO COOLING UNIT

The driver has access to the equipment compartment through a door in the front of the trailer and operates all the electrical equipment, which can be plug-

DEMONSTRATING training aids available, Trainor stands on speaker's dais, using microphone. At his feet is hi-fi recorder. At his right are rear-projection screen and magnetic blackboard.



ged into commercial power when available.

A plastic porthole has been placed in the condensing unit compartment through which he can see permanently installed gauges without removing the casing.

It would cost many thousands of dollars to duplicate the trailer commercially, but it has proven its worth in better teaching results.

The school looks upon it as experimental and is continually adding new features or improving ones already installed.

The air conditioned trailer was the idea of Colonel Frank J. Polich, director of the Department of Mechanical and Technical Equipment of The Engineer School.

Among the 7,000 students a year trained by this department are specialists who care for and maintain the military's growing number of air conditioning and refrigeration equipment.

Most of the conversion work was done in the Post Engineer Field Maintenance Shop, under the supervision of C. A. Taylor, by Jims Barnes and Oren Dameron.

Robert F. Trainer, assistant branch chief, Technical Equipment Branch of the Department of "Mech and Tech," acted as coordinator on the project.

## Klixon Protectors assure customer satisfaction, says motor repair shop partner

TROY, N.Y.: Mr. Leroy Baker, a partner in the P & B Electric Company, this city's largest single phase motor repair shop, knows the important role Klixon Protectors play in preventing motor burnouts. Here's how he put it:

"Klixon Protectors not only give us a higher percentage of profit over major repairs, such as motor rewinds, but also give assurance that our jobs will be protected satisfactorily after repairing."

Klixon Protectors reduce service calls and repairs by preventing motor burnouts.

The Klixon Protector is built into the motor by the motor manufacturer. In such equipment as refrigerators, oil burners, washing machines, etc., they keep motors working by preventing burnouts. If you would like increased customer-preference, reduced service calls and minimized repairs and replacements, it will pay you well to ask for equipment with Klixon Protectors.



Write for the new free informative Booklet, "THE STORY OF THE SPENCER DISC."

**METALS & CONTROLS CORPORATION**  
Spencer Thermostat Division 2412 Forest Street, Attleboro, Mass.  
**KLIXON**

For more information about products advertised on this page use Information Center, page 9.

## Service Needs-- Dervey Named--

(Concluded from Page 1, Col. 4)

aren't familiar with the latest developments in the industry and often haven't had enough experience with the bigger equipment. Sometimes they try to cover up their lack of knowledge," he added and the results of this are seldom good.

"Refrigeration contractors and servicemen should be able to advise the retailer as to what type of equipment he should buy," he quoted an operator.

"Lack of follow-through after the equipment has been installed and started up was a complaint against servicemen voiced by one contractor.

"Another said, 'we'd rather hear the music of the cash register than the noise of improperly installed lines.'

"However, we expect both the equipment and the servicemen to perform miracles," Longenbaker stated.

Offering a specific suggestion on installation, Longenbaker advised insulating all exposed tubing located below the kick-plate of fixtures "so water doesn't collect on the floor in front of the case."

Regarding equipment itself, this IGA engineer wishes manufacturers "would locate the drains of all cases in the same place," and that someday somehow there'll be available "self-contained cases with noiseless units to save space, installation time, and copper lines."

(Concluded from Page 1, Col. 5)

been in a sales management position for 11 years with a construction equipment firm.

Preliminary estimates of Waterbury's final 1957 sales indicate a volume—for the company and its subsidiaries—slightly in excess of its 1956 total, it was stated.

Dervey credited part of the firm's steady growth to the setting up of new distributors on the west coast during the year, and the development there of a satisfactory sales volume.

Further expansion plans for 1958 are tied to Waterbury's increasing volume in the new home building field, and to added emphasis on replacement furnace sales through the company's distributor and dealer organizations. Steps have already been taken to implement these programs, Dervey said, through the redesigning and restyling of product models.

**U.L. & A.S.M.E. WATER-COOLED CONDENSERS 1/4 TON to 15 TONS and LIQUID RECEIVERS for EVERY REQUIREMENT**  
**STANDARD REFRIGERATION CO.**  
332 S. Hoyne, Dept. C  
Chicago 12, Ill.



## Inside Dope

By GEORGE  
F. TAUBENECK

(Concluded from Page 1, Col. 1)  
thought you would enjoy the attached letter.

E. T. BENSON,  
Service Manager  
Frigidaire & Household  
Appliances  
Civilian Personnel Office  
United States European  
Command

Gentlemen:

A friend of mine had a dog that for a time slept outside and ate the scraps from the table. But once while his wife was away visiting her Mother, he allowed the dog to sleep in the house on the sofa and fed him with good raw meat. When the wife returned the dog was again put outside and returned to the original diet. The dog became moody and even vicious so that he had to be given to a farmer, who changed his temper only through patience and understanding.

When a wife becomes accustomed to your Frigidaire, and then is forced to manage without it she can be equally uncompromising. I cannot give her away, so the solution numbers of the part to be replaced.

As you probably know, the fury of a woman is like a flea on a dog's back—SEND AIR MAIL! Please enclose an invoice and payment will be made promptly.

JOHN ARLIN MINCHER  
Civilian Personnel  
Representative

### Thoughts for Scientists

Dope:

I enjoyed your provocative editorial: "Is Accelerated Scientific Progress Ignored by our Industry?"

I have been somewhat like the amateur author mentioned in your INSIDE DOPE who was writing a book on "S.O.B.'s I've Known." Every time he thought the book was done he met another one. We must agree with you that one of the mistakes of our industry is "plodding-in-the-same-ruts-prevalent in the 1930's."

You ask: "Who and where are the inventors whose bold imagination could revolutionize our products?" The same mail bringing your editorial also brought a copy of *Chemical and Engineering News* which says: "Wanted: GOOD Ideas. Standard Oil Co., (Ind.) wants to make sure that any good ideas its scientists get will be considered. So it has set up a committee to evaluate research suggestions."

It takes more than inventors and a committee to revolutionize one's products. The Sheldar required creative thinking in all management, i.e., development, manufacture, pricing and finances, production and sales.

When is a workable idea a "good idea?" Mr. Carl Munters, inventor of many valuable items including the gas refrigerators, told me a few months ago that the biggest problem he has is not the idea but rather the steps necessary to put it across.

So we do not say: "Who and where are the inventors etc.?" Rather we should probably ask:

"Who and where are the managers whose bold imagination will permit them to put not  $\frac{1}{2}$  or 1% but rather 3, 5, or even 10% into factory sales price to be used for studying and developing workable ideas to learn whether they are 'good?'"

The wonder drugs we hear about come from the willingness to put money into the sales price of existing drugs to finance the development of new drugs and here 10% is often still a piker figure.

For this boldness of management to succeed one must also find salesmen with the bold imagination required to do the creative selling needed to put across the good ideas and to get money to convert other workable ideas into "good ideas."

We search for the inventor who will wave a magic wand and give us our "break through." The comments after a cursory

check of his idea are almost standardized. They go something like this: "The system is expected to be relatively slow and expensive to operate (or make).

We fall back on an objection based on economics whereas usually neither the inventor nor the business man knows much about the cost of a new item until it has been thoroughly investigated. Even reliable estimators often do not know and have to estimate safely. I have seen early estimates which were more than double the actual cost on unique items.

So we come to the question of which comes first the chicken or the egg? The young son of a friend tells me the chicken came first because he is sure "God wouldn't lay an egg."

We start with chickens to get eggs, we sort the eggs, incubate and hatch them. Then we feed

and protect the chicks to get more grown chickens. Similarly whether it be for a Sputnik type satellite or a new refrigerator, the cost of our ideas or eggs is a very small item (\$30,000 for Mrs. West's idea).

Sorting the ideas, hatching them, nurturing them to final development takes the most dollars.

Only then do we get the finished product from which is returned our original investment with interest.

In other words start a "good bull session" with a group of engineers on the work they are doing and the workable ideas will appear. From here on we need the "blood, sweat and tears" to sort, hatch and nurture these ideas. The ideas usually die at this point because we do not have the "bold imagination" to carry out the succeeding steps.

I was going to end this by

saying: Good Ideas Need Sales Imagination and Creative Sales Work." Then I noticed a picture of the great electrical wizard, Steinmetz, in the November 15, Issue of *Forbes* magazine. Under the picture was the statement:

"GOOD IDEAS NEED GOOD MANAGEMENT."

ROBERT S. TAYLOR

Air Engineers  
Fullerton, Pennsylvania

Editor:

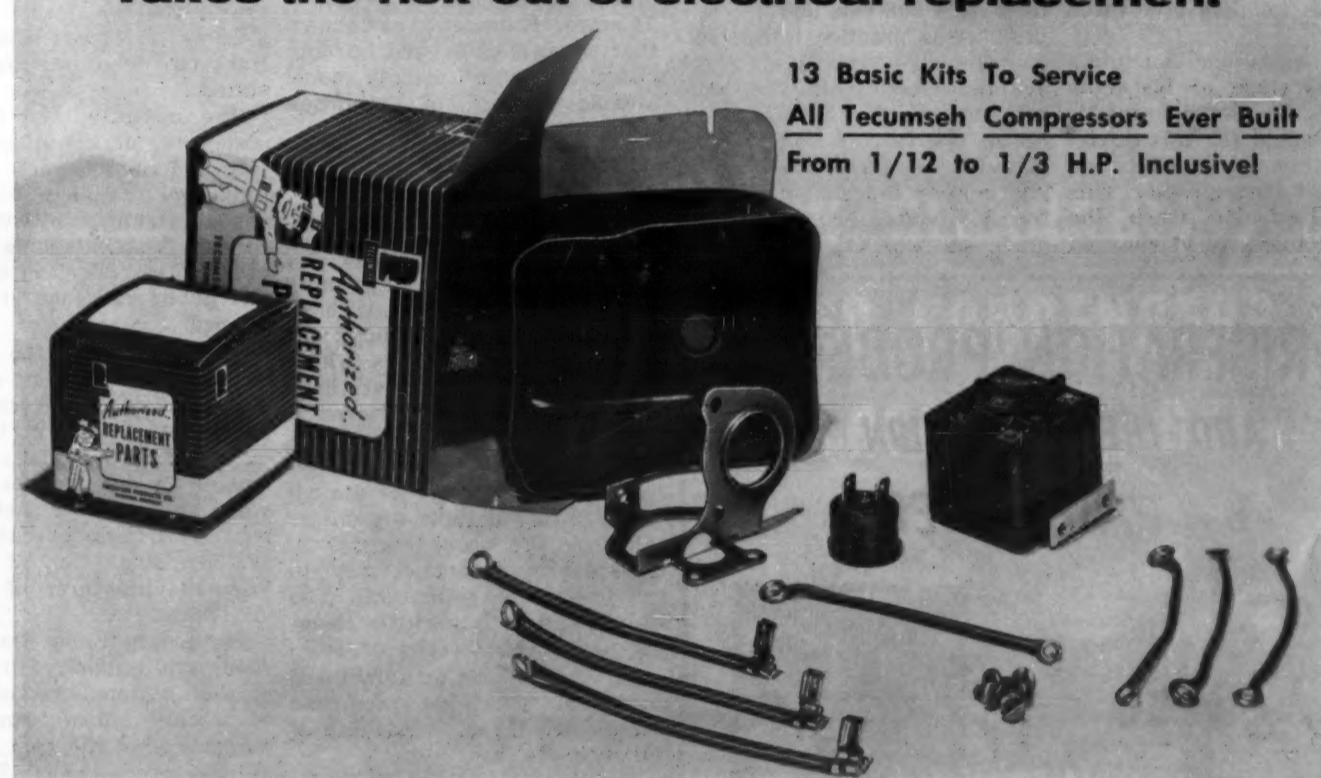
I was very interested to see your editorial on page 16 of your Nov. 4 issue. We have always been careful to do an honest job of presenting window air conditioners to our customers and I am glad to see your efforts to get this whole situation straightened out nationally.

I. F. LEGRAND

# Tecumseh

## engineering VISION

### Takes the risk out of electrical replacement



13 Basic Kits To Service  
All Tecumseh Compressors Ever Built  
From 1/12 to 1/3 H.P. Inclusive!

That's right, only 13 basic electrical kits are necessary to stock factory approved electrical components: 5 kits for pancake compressors and 8 kits for single cylinder internal spring mount compressors. These 13 kits will allow replacement on 70% of the approximately 30,000,000 Tecumseh compressors now in the field.

All of these kits are neatly packaged in a distinctive yellow and blue carton and contain all the pieces necessary to replace the overload and relay on these models. In addition to the correct overload and relay, where necessary, terminal screws and two sets of 3 wires are included. One set has eyelets for screw-type terminals and the other has quick-disconnect clips for glass terminal compressors. You use the ones required and throw away the other set.

In some cases the replacement relay will not fit under an older cover and a jumper wire is needed. In the sizes where this problem may occur (high torque  $\frac{1}{4}$  and  $\frac{1}{3}$  H.P.) a new cover, mounting bracket, and an extra wire are included in the box. In this way, one kit will fit all existing models.

Instructions and wiring diagrams are included with every kit so the serviceman should have no trouble with the connections. To order, you must know only the H.P. and whether or not it is high or low torque. There is only one exception to this which is our Model S3N14. In addition to regular applications this model was used on room air conditioners and this application requires a special kit.

Here is a real improvement to take the guesswork and chance of error out of the replacement of electrical components. Save inventory problems and be right every time with a genuine Tecumseh approved replacement.



The Leader Serving Leaders in the Air Conditioning and Refrigeration Industries

**TECUMSEH PRODUCTS COMPANY**

MARION, OHIO

TECUMSEH, MICHIGAN

EXPORT DEPT: P. O. Box 2280, 24530 Michigan Ave., W. Dearborn, Michigan

## Service & Supplies

Change Refrigerant When Unit Overheats?

### RSES Panel Answers Queries on Refrigerants, Motors, Switches

CHICAGO—Three "Information Please" question and answer sessions were held here during the annual meeting of the Refrigeration Service Engineers Society. Speakers who presented prepared talks on the convention program and other authorities in the industry made up a panel from which answers to open questions from the floor could be obtained.

The questions covered all phases of the industry, from chemical problems with slime to electrical problems on 208-volt networks. Answers were normally given by more than one panel member and sometimes the answer came from the floor. The following questions were of general interest.

**Q.** If a unit, for some reason, has overheated temporarily, is it necessary to change the refrigerant to prevent future damage?

**A.** Assuming the cause of overheating has been corrected and that no great amount of acid has formed, it would be unnecessary to remove the refrigerant. It would be advisable to place a new drier on the unit to remove any breakdown products which might have been formed.

**Q.** At least one manufacturer ships some of his units charged with Refrigerant-11, and the formula for this refrigerant is stamped indelibly on the head of the compressor. This leads to confusion when the units are actually to be charged

with Refrigerant-12 or 22. Why not some removable tag so that there is no confusion once the system is in service? Why is Refrigerant-11 used?

**A.** Refrigerant-11 is used because of its nominal pressures at room temperatures. The manufacturer is probably complying with Interstate Commerce Commission directives which call for a plain label to be used if a unit is to be shipped with a charge in it. However, there should be some way to remove the label. Contact the manufacturer on this problem; he will work with you.

**Q.** We have encountered a compressor for use with Refrigerant-12 which calls for a 275 p.s.i. discharge pressure. The unit is a 3-hp. air-cooled job. Is this a realistic discharge pressure for Refrigerant-12?

**A.** This particular equipment was manufactured for a specific military use in desert climates where the ambient can reach 150° F. The unit was designed for these conditions. Normally, such a discharge pressure would be considered too high.

**Q.** Can 230-volt motors be used on a 208-volt line?

**A.** This practice is not recommended—especially since the actual available voltage on 208-volt networks has been found to be as low as 187 volts. Some manufacturers are now supplying motors especially designed for 208 volts, 195 volts, and other voltages. If such special

motors are required, give the manufacturer about six weeks.

**Q.** We're having trouble with a 5-hp. unit; the starting switches are burning and sticking together at only 25 amps, while the place calls for 42 amps.

**A.** There seems to be some discrepancy; actually a 5-hp. unit will normally draw about 21 amps. Experience has shown that when sticking and burning occur, there is usually some outside source of vibration which causes the points to chatter together and finally fuse.

On the general subject of current drawn by motors, it was pointed out that the use of fusitrons or special relays can prevent stoppage during short periods of overload—without violating electrical codes.

**Q.** On water coolers which are used in taverns we are having difficulty with slime forming and fouling the lines. Is there a preventative?

**A.** In this case, the atmosphere is full of those organisms which cause slime or live growth. There is no practical way to prevent their formation. The only solution is periodic cleaning—every two weeks or so.

**Q.** Are certain manufactured units more poorly designed than others from the standpoint of oil return?

**A.** Such field-controlled characteristics as line size, shape, and length are more important in obtaining good oil return. A simple thing like giving a slight pitch to a long horizontal run, has solved oil return problems blamed on compressors.

Air Conditioning & Refrigeration News, December 30, 1957

### Manning Heads RSES Officer Group for '58



NEW OFFICERS of Refrigeration Service Engineers Society are (l. to r.): J. Lawrence Hall, John H. Spence, Robert Duke, Paul Darby, William Goeckle, Denver J. Wathen, William V. Peek, George R. Klahn, Carl Howenstein, Charles G. Bell, Leopold Zolin, A. E. Manning, A. J. Pike, H. T. McDermott, Michael Rudka, and Milton O. Larson.

CHICAGO—A. E. Manning, vice president of Kelmore Corp., Newark, N. J. was elected president of the Refrigeration Service Engineers Society at its annual meeting here.

Other officers elected were George R. Klahn, first vice president; Denver J. Wathen, second vice president; H. T. McDermott, secretary; Charles G. Bell,

treasurer; Paul Darby, sergeant-at-arms; and John H. Spence, chairman of the educational and examination board.

Michael Rudka of Toronto was elected as a member of the board of directors for a one-year term. He replaces Walter W. Smallwood, also of Toronto, who resigned.

In addition to Rudka who will

serve Smallwood's unexpired term of one year, the following men were elected to the board for two-year terms: Robert Duke, A. J. Pike, Milton O. Larson, Leopold Zolin, and William Goeckle.

Continuing as directors are Orville W. Brown, J. Lawrence Hall, Carl Howenstein, and William V. Peek.

### IHACI Names Snow Managing Director

LOS ANGELES—Appointment of Randall M. Snow as managing director of the Institute of Heating and Air Conditioning Industries, Inc. was announced by Robert N. Hall, president.

Snow replaces Rudolph E. Harkens, who resigned, Hall stated.

The institute is a trade association of Southern California manufacturers, distributors, and installers of heating and air conditioning systems. It carries on an extensive program of industry education standards and public relations, it was explained.

Snow brings to the institute 26 years of public relations, merchandising, and trade association experience in the heating, air conditioning, and automotive fields. He served 11 years as sales promotion and public relations executive with Walker Mfg. Co. of Racine, Wis., manufacturer of automotive parts.

Previously Snow was advertising and publicity director for several national manufacturers of heating and air conditioning equipment in the east, member of the executive staff of the Heating, Piping and Air Conditioning Contractors National Association and of the national Anthracite Coal Industry trade association located in New York City.

Hall said the institute welcomes the new executive "as it embarks on a greatly expanded program of services to its members."

### Offers Associate Degree in Refrigeration, Cooling

DETROIT—Lawrence Institute of Technology here now offers an associate of engineering degree in air conditioning and refrigeration in its Technical Institute, the school announced.

Claimed to be the first school of its kind in Michigan, the Technical Institute night school works in cooperation with Detroit industry and offers technical courses such as those given at Purdue and Temple universities.

### Buffalo ASRE To Hear Heat Pump Talk Jan. 9

BUFFALO—Technical aspects of the heat pump will be discussed by M. A. Ramsey, consulting engineer for the Air Conditioning & Refrigeration Div., Worthington Corp., at "Old Timers' Night," the Jan. 9 meeting of the local American Society of Refrigerating Engineers section.

An annual event held in conjunction with the anniversary of the chapter, Old Timers' Night "will be complete with birthday cake and prizes."

**SAVE \$\$\$**



100%  
BRASS  
CONSTRUCTION

**WABASH**  
**HI-DRI**

Lowest Priced  
All Brass Dryer  
On The Market Today

Because of improved production techniques, we make the lowest priced, quality, heavy duty all brass dryer available. HI-DRI's performance tops or equals that of any other dryer. HI-DRI has all the same qualities . . . all brass shell, PA-400 silica gel, brass outlet screens, seams silver soldered, 100% guaranteed, but . . . is lower priced. Increase your profits by using Wabash. Write for information today.

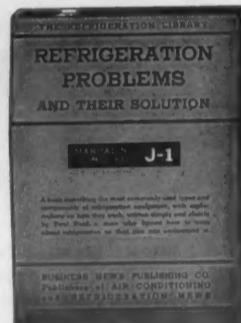
**WABASH CORP.**  
2300 S. Western Ave.  
Chicago 8, Ill.

#### Reprints Available

Hermetic Compressor Design, Development, by Henri Soumeral. Only 40¢ each. Mail this ad with name and address to: Air Conditioning & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.

## REFRIGERATION PROBLEMS AND THEIR SOLUTION

by PAUL REED



ONLY \$1 50  
EACH

Make it work! When you're stopped by a tough problem use these practical reference books with a load of factual information about every refrigeration problem you'll meet as a serviceman or salesman. For years Paul Reed has been supplying the answers in his weekly column in AIR CONDITIONING & REFRIGERATION NEWS.

Now this fund of knowledge can be yours in this 5-volume set. Order all now—or one at a time.

BUSINESS NEWS PUBLISHING CO.  
450 W. Fort St., Detroit 26, Mich.

12-30-57

Please send Paul Reed's books as follows:

..... copies J-1, \$1.50 each. .... copies J-2, \$1.50 each.  
..... copies J-3, \$1.50 each. .... copies J-4, \$1.50 each.  
..... copies J-5, \$1.50 each.

Check for \$..... enclosed\*  Bill me.

Name.....

Address.....

City..... Zone..... State.....

\*Books sent post-paid if remittance accompanies order.

For more information about products advertised on this page use Information Center, page 9.

## West Coast Factory Branch Set Up by C. V. Hill



LOS ANGELES—A new direct factory branch has been established here by C. V. Hill & Co., Inc., with a staff to completely plan, engineer, and service stores and supermarkets in this area.

George O'Donnell, a veteran of 30 years with Hill, is branch manager. T. L. Mohr is engineering and service manager.

The new branch is housed in a building constructed especially for the purpose of displaying and warehousing Hill commercial refrigeration cases.

C. V. Hill & Co. bought the property, centrally located at 4400 San Fernando Rd., Glendale 4, and erected the building which provides warehouse facilities of 144,000 sq. ft. and a large salesroom 100 by 60 ft. including sales and engineering offices.

The Hill company decided to terminate its two dealer franchises in the Los Angeles area, Consolidated-Hill and Jacob Market Equipment, in order to have adequate facilities with which to serve its customers and to have adequate stock on hand to quickly serve other west coast dealers, it was further explained.

The new branch serves Los Angeles and Orange counties directly, and carries a \$250,000 stock of Hill cases in the large warehouse.

The stock is replenished by boat shipments directly from Trenton, N. J. to Los Angeles.

The warehouse stock of cases is being used to supply other Hill distributors on the west coast to a considerable extent, particularly in southern Calif.

fornia, and the San Joaquin valley.

O'Donnell said Hill policy has been averse to operation of branch offices until now, when the need of superior facilities was recognized to serve the California.

LARGE display room is 100 ft. long and 60 ft. wide. Sales and engineering offices are located at the far end of this new direct factory branch building erected by C. V. Hill & Co., Inc. to serve Los Angeles and west coast distribution needs. George O'Donnell, branch manager, stands at right.

rapidly-growing coast market.

The new branch features a complete package job of market installation and service, with direct sales, store planning, engineering, custom-built woodwork, Birkenwald section gondolas and shelving, and service available 24 hours every day.

The new branch has been incorporated as a subsidiary in California under the parent company name, C. V. Hill & Co., Inc., and is a member of Refrigeration & Air Conditioning Contractors Association of Southern California.

### In Third Quarter

### NCRSA Figures Show Slight Rise over '56

PHILADELPHIA—Total dollar sales reported by members of the National Commercial Refrigerator Sales Association submitting figures for the third quarter showed a barely perceptible average increase of .11% over the same period of 1956, the association announced.

Accounts receivable as of Sept. 30 jumped 16.33% over the same date in 1956.

Total dollar sales for the first three quarters of the year were down 9.07% from the same period in 1956.

Dollar net profit before taxes for the third quarter was off .54%.

Inventory on Sept. 30 was shaved 3.44% below the same date in 1956.

### C. B. Carr, Sr. Dies at 61

TOLEDO—Retired due to illness two years ago, the founder of Carr Refrigerating Co. died here recently.

Charles B. Carr, Sr., 61, who founded the contracting business in 1934 and maintained it to 1955, was seized with a heart attack.

Jovially calling himself "the biggest man in the refrigeration industry" because of his 385-lb. weight, Carr was a charter member of the refrigeration contractors association and a member of American Society of Refrigerating Engineers.

### To Pay Dividend

LA CROSSE, Wis.—The Trane Co. board of directors has announced a fourth quarter cash dividend of 22½ cents on the manufacturer's 2,129,846 shares of common stock. The dividend is payable Feb. 1.

*So Halstead & Mitchell Engineers Said...*

**COUNTERFLOW, CLEANABLE WATER-COOLED CONDENSERS MAKE "CHAIN-REACTION" SALES**

**A CHAIN REACTION**—one sale leads to another when users experience the twin advantages of H&M's Water-Cooled Condensers—peak efficiency and lowest maintenance.

Double-tube design and counterflow introduction of water and refrigerant assure most efficient heat transfer. Refrigerant flows through the outer tube and the water through the inner tube for maximum heat interchange.

Removable headers permit easy water tube cleaning with a simple, accessory cleaning tool. Scale and sludge

which reduce heat transfer are removed without harmful chemical cleaners. Condenser capacity is maintained at clean-tube performance ratings for unit lifetime.

Condenser compactness makes these units ideal for conversion of under-capacity air-cooled refrigeration systems. All H&M units are U/L approved for use with refrigerants -12 or -22.

Call your wholesaler or write Halstead & Mitchell, Bessemer Building, Pittsburgh 22, Pa.

**Redmond**  
**MICROMOTORS**  
One of largest stocks  
in the world!  
FACTORY DISTRIBUTORS  
MARVIN L. "FERNIE" FERGSTAD  
**CYCLO-FREEZE CORP.**  
6318 Cambridge, Mpls. 16, Minn.  
West 9-6794

Thinking of—  
• changing territories  
• expanding your territory  
• taking on new lines—  
  
Check the  
**CLASSIFIED ADS**  
  
Your opportunity may  
be there.

#### ONLY HALSTEAD & MITCHELL OFFERS THIS WIDE CHOICE

**HEAVY DUTY** (Type T) condensers have a highly favorable fouling factor and are designed for long service between cleanings.  $\frac{1}{2}$  through 25 tons.

**STANDARD DUTY** (Type EL) are made with extended surface water tubes, ideal for water-cooled systems under all average conditions.  $\frac{1}{2}$  through 3 tons.

**REPLACEMENT CONDENSERS** (Type R) are shorter, higher condensers designed for use in package air conditioners. Easily installed.  $1\frac{1}{2}$  through 10 tons.

**SEA WATER CONDENSERS** (Type SW) are made with cupro-nickel water tubes and naval brass headers for resistance to impure water.  $\frac{1}{2}$  through 25 tons.

**Halstead & Mitchell**

They'll  
Do It  
Every  
Time  
by  
Jimmy  
Hatto



## Final Word (1957) on Unions In the Air Conditioning Business

TRUE STORY: "It was like this," said the man on the phone, "there was this contractor who got a store air conditioning job, and while he was working on it, the union agent for the sheet metal workers came around and asked if he had a sheet metal shop.

"When the contractor replied that he didn't, the agent said, 'you'll never be able to do another air conditioning job around here.' Union man added that the 'air conditioning business belongs to the sheet metal shops,' and that he (the agent) was going to see that this was the way it was 'going to be.'"

And what were we at the News going to do about this situation, prodded the man on the phone. Shouldn't we call this situation to the attention of the industry, and arouse action?

If situations such as these exist on any scale, the News certainly does want to do something about them. We hope that readers will alert us to such so that we can dig facts which could foster corrective action. (In the particular instance cited, the complaining contractor hadn't been blocked out of any jobs—we learned after investigation—the Union agent merely was threatening.)

Although flagrant abuses of the right of free enterprise certainly are proper topics for our Editorials, in the long run the union situation will have to be resolved by mutual understanding amongst all elements of the industry—particularly among the various types of contractors who are active in the field, and the unions whose members perform the labor on air conditioning installations and service contracts.

An ideal contractor situation (one in which there would be a minimum of conflict and labor troubles) is that wherein the contractor possesses all necessary skills among his own shop personnel (refrigeration, sheet metal, pipe fitting, electrical, etc.) to complete any installation.

However, this is rarely the case. In most air conditioning installations some part of the work is sub-contracted. If sub-contracting in air conditioning installations ever were to be banned by Unions, sales of the industry's goods would be so retarded, and the industry's over-all progress so stunted, that it might never get into shape to battle for its share of the consumer dollar.

Likewise, there is no one type of skilled labor that can "claim" all of the work

required in an air conditioning installation. Certainly the refrigeration mechanic can be trained to do minor plumbing and electrical work, and this is being recognized in some labor contracts and in several municipal codes.

However, it is not likely that said mechanic easily can become a qualified sheet metal worker, any more than a qualified sheet metal worker can be expected to become an expert refrigeration mechanic overnight.

Instead of standing around and feeling persecuted and hollering for a cop, the contractor can get together with his fellows in either a formal or informal organization, to iron out mutual problems. In turn, this group can meet with representatives of labor organizations, and other contractor and wholesaler associations which have an interest in the industry.

**What about the labor unions?** Some of them have shown reasonableness where they have had the opportunity of sitting in joint sessions with contractor groups and delving into such problems as artificial boundaries (both geographical and job descriptive) labor contracts, lack of adequate supply of skilled workers and programs to solve the same, recognition of new crafts in the air conditioning field, and the need for cooperative effort in advancing the growth of the air conditioning business.

Both the industry and the buying public have the right to demand that our industry's products be installed and maintained by properly qualified personnel.

Nevertheless, there is no reason why this concept should be twisted to mean that the sale and installation of air conditioning equipment "belong" exclusively to any one type of contractor or dealer, or one rigidly unionized type of skilled labor.

**When the founder of this publication**, the late F. M. Cockrell, was promoting the interests of the electric appliance industry in its early days, he coined the slogan "business belongs to the man who goes after it."

That's the American Way, and that's the way it should be.

As a matter of fact, in the air conditioning industry, that's the way it is. Those who have best succeeded in selling air conditioning are those who have geared themselves to do a "specialist" job in this field of endeavor, regardless of their previous business backgrounds.

AN INTERNATIONAL INSTITUTION • SUBSCRIBERS ALL OVER THE WORLD

Trade Mark  
reg. U.S. Pat.  
Office;  
Est. 1926

AIR CONDITIONING  
& REFRIGERATION  
NEWS

Copyright  
1957,  
Business News  
Publishing Co.

F. M. COCKRELL, Founder

### The Conscience of the Industry'

Published Every Monday by BUSINESS NEWS PUBLISHING CO., 450 W. Fort St., Detroit 26, Mich. Telephone Woodward 2-0924. Subscription Rates: U. S. and Possessions and Canada: \$6.00 per year; 2 years, \$9.00; 3 years, \$12.00. All other countries: \$10 per year. Single copy price, 40 cents. Ten or more copies, 30 cents; 50 or more copies, 20 cents each. Send remittance with order.

EDITOR & PUBLISHER,  
George F. Taubeneck

EDITORIAL DIRECTOR,  
Phil B. Redeker

ASSOCIATE EDITOR,  
C. Dale Mericle

ASSISTANT EDITORS:  
John Sweet

Hugh Maher

George Hanning

Robert Lacey

Frank Versagi

STATISTICAL EDITOR, John MacLean

GEN. MGR., Warren Jones

GEN. PROD. MGR., Walter Schuler

ADV. PROD. MGR., A. M. Barrow

CIRCULATION MGR., Herbert Spencer

SUBSCRIPTION MGR., Rosalie Ashley

READER'S SERVICE MGR.,

Vincine Mogyorodi

PRESIDENT, Edward L. Henderson

ADV. MGR., Robert M. Price

WESTERN ADV. MGR.,

Allen Schildhammer

ASST. ADV. MGR., Joe Sullivan

ADVERTISING REPRESENTATIVES:

Rex Smith

Frank Taylor

ADVERTISING OFFICES:

New York, 521 Fifth Ave.  
MURRAY Hill 2-1928-9

Robert M. Price

Frank Taylor

Chicago, 134 S. LaSalle St.  
FRANKLIN 2-8093

Allen Schildhammer

Rex Smith

Detroit, 450 W. Fort St.  
WOODWARD 2-0924

Joe Sullivan

Los Angeles, 4710 Crenshaw Blvd.  
AXminster 2-9501

Justin Hannon

Member, Audit Bureau of Circulations. Member, Associated Business Publications.

VOLUME 82, NO. 18, SERIAL NO. 1,501, DECEMBER 30, 1957



### WHAT SHOULD HE DO? GET A REFRIGERATION JOB?

85 Allerton Ave.

East Providence 14, R. I.

Editor:

I am writing this letter for the purpose of gaining some advice or suggestions concerning a matter which to me is of the utmost importance, that of employment. I know that you have given much helpful advice to many of the readers of AIR CONDITIONING & REFRIGERATION News and I am sure that you can advise me constructively at this time.

I am married, forty-nine years of age, in excellent health and have been employed in the textile industry for thirty-two years, the last ten years of which were in the capacity of department foreman. Because of its almost complete disappearance from the northern area, it is increasingly difficult to find employment in this line of work. My situation requires a decision: Should I remain in

textiles or attempt to find employment in the air conditioning and refrigeration industry.

I realize fully how far the textile trade is removed from that of air conditioning but I do have a rather extensive theoretical background as well as some practical training in refrigeration and air conditioning.

It was at the South Shore School of Refrigeration that I received a great deal of practical experience on both refrigeration and air conditioning.

On the basis of my past history, would you kindly offer your frank opinion as to what my chances are for breaking into this different field of employment, whether it be at the factory, distributor, or dealer level. If you do believe such a move to be practical and profitable in my case, would you kindly suggest the next step I should take.

ROLAND W. STARKE

### DECRIES 'ROBBING' INVENTORS OF PATENTS

Chemex Corporation  
New York 7, New York

Editor:

Your editorial: "Is Accelerated Scientific Progress Ignored by Our Industry?" is very challenging.

I am now exactly 30 years at this inventing business, ever since I made my PH.D. in physics and chemistry at Berlin University back in 1926. In all those 30 years, I have never been employed—not for a single day. I just peddled my patents and sold "Scientific Progress" successfully.

But in spite of this personal success (which was just salesmanship) I will flatly and broadly state: Industry is NOT interested in progress.

Industry now even goes so far as to tamper with the Patent

Law to curtail the freelance inventor, to rob him of his only weapon: the Patent.

DR. PETER SCHLUMBOHM

### WANTS REPRINTS

Hauck Bros.  
231 S. Center St.  
Springfield 23, Ohio

Editor:

We would like to receive two each of both articles on the "Economics of Air Conditioning" by John E. Harris, if you decide to make reprints available.

We would like to take this opportunity of telling you how much we have enjoyed your paper. Of all the trade magazines we take, yours is the most informative.

ELDEN L. HAUCK

## Electric Baseboard Heaters Added In 2 Lengths



## KEY NO. G-1252

PITTSBURGH—Two new lengths of electric baseboard heaters—4 and 6 ft.—have been added to the 2-ft. length previously available from Westinghouse Electric Corp. The new sections are claimed to provide maximum flexibility in baseboard heating installations.

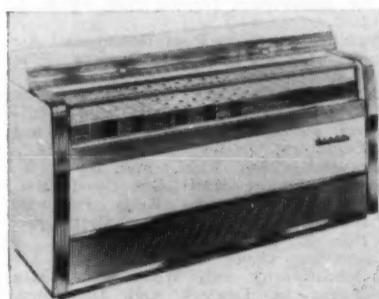
Use cuts installation time, since there are fewer sections, few connections, and faster assembly, the company said. The units are installed along the wall in place of baseboards.

## Ice Cream, Frozen Food Merchandiser Announced

## KEY NO. G-1251

LOS ANGELES—A new gravity type cabinet for the sale of ice cream and frozen food products has been announced by the Weber Showcase & Fixture Co., Inc. The new "Kold-Master" is a companion for the Weber "Blizzard 161."

Weber Kold-Master is 84 1/2 in. in length, 31 in. wide, and new low front handrail is 38 in. high. It has a selling capacity of 1,211 pint packages. The cabinet features low streamlined design, enhanced by an eye-catching, wear-resistant, fabric-textured color



trim strip, and is claimed to offer the maximum in product display through the front.

## Large Oven Highlights 30-In. Range Line



## KEY NO. G-1250

CHICAGO—The 1958 Admiral range line is highlighted by a large oven in a 30-in. range, large oven door picture window, fashion

fronts, recessed and divided tops, removable oven doors to simplify cleaning, and a "Slimline" built-in look that permits flush with wall and cabinetry installation, it was announced.

Prices have been "slightly hiked" on the units.

The 40-in. ranges and three 30-in. models comprise the 1958 line. All ranges match the standard depth of kitchen cabinets. They are Underwriter's Laboratory approved for flush installation next to walls and beside wood cabinets.

Two different fashion fronts across the bottom door or drawer are features, depending on the model. First version is an anodized satin aluminum panel that can be wiped clean with a damp cloth. The other is a regular dotted pattern on the porcelain enamel finish.

"Giant" picture window on two 30-in. models measures 13 by 21 in.

## Information Center

For more information on What's New products, current literature and catalogs available, equipment advertised in AIR CONDITIONING & REFRIGERATION NEWS use Key Numbers where designated or specify products advertised and we'll see that you receive this information promptly.

Products Advertised  
(list name, page, and issue date)

## What's New or Current Literature Available

Key No. .... Key No. ....  
Key No. .... Key No. ....

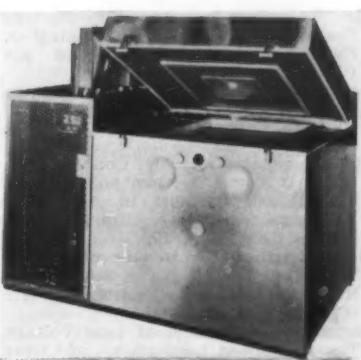
Name ..... Title .....  
(Please Print)

Company .....  
Street .....  
City ..... Zone ..... State .....

Type of Business .....  
MAIL THIS FORM TO

AIR CONDITIONING & REFRIGERATION NEWS  
Readers Service Dept.

450 W. FORT ST. DETROIT 26, MICHIGAN



## Designs Cabinet To Function-Test Metal

## KEY NO. G-1253

N. HOLLYWOOD, Calif.—A sub-zero testing cabinet designed to function-test metal, and other components has been put on the market by C.T.C. Mfg. Corp. under the name "Zerolab."

Items are easily tested in the Zerolab for abilities to withstand extremes of vibration and sub-zero temperatures that go down to -150° F., the company claims.

Zerolab, model 101, is entirely self-contained. It has a two-stage freezing system powered by two 5-hp. compressors for most rapid temperature depression, it was added.



## Automatic Fluxing System Developed

## KEY NO. G-1254

WHITE PLAINS, N. Y.—A larger size of its "Jet Flux" automatic fluxing system and an improved metering valve assembly, which is interchangeable on all models and sizes, has been announced by All-State Welding Alloys Co., Inc.

It consists of an automatic unit which, installed in the acetylene line, accurately proportions Jet Flux brazing liquid to the flow of fuel gas and mixes them, causing the flame to have a greenish tint—a sign that tells the operator his work is being properly fluxed at the right time and place.

Automatic fluxers of this type heretofore available have been limited in capacity to a half-gallon of Jet Flux liquid. The new "Jumbo Jet" tank holds a full gallon, according to the company.



REMCO INC.  
ZELIENOPLE, PA.

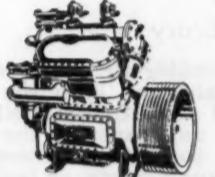
## Re-Engineers Bases

## KEY NO. G-1256

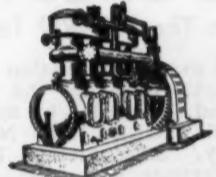
PHILADELPHIA—A re-engineered line of "Econ-O-Matic" motor bases announced by American Pulley Co. are claimed to provide complete automatic tension control of short-center belt drives up to 250 hp.

Econ-O-Matic motor bases automatically control belt tension by harnessing the reaction torque inherent in every motor to provide exactly the right tension on the belts at every instant. Drive efficiency is increased and belt life is lengthened.

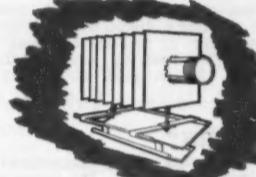
Trying to find  
the right man for a  
hard-to-fill vacancy—  
the NEWS' Classified  
Ads are read by your  
man.  
Place your ad today!

THE LEADER IN REFRIGERATION SINCE  
1882

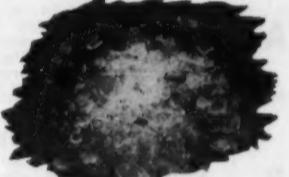
ECLIPSE COMPRESSORS



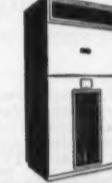
HEAVY-DUTY COMPRESSORS



PREST FIN PIPE COILS



ICE MAKERS



AIR CONDITIONING



VALVES &amp; FITTINGS

ECLIPSE COMPRESSORS  
2 to 9 cylinders

HEAVY-DUTY COMPRESSORS  
3 by 3 to 17 1/2 by 12

AIR HANDLING UNITS

QUICK FREEZING SYSTEMS

BLOCK & SHELL ICE MAKERS

CONDENSERS  
Evaporative & Shell & Tube

AIR CONDITIONING

LOW PRESSURE REFRIGERATION  
UNITS  
1/4 to 15 H.P.

CONTROLS, VALVES & FITTINGS

SHELL & TUBE & COIL COOLERS

DEPENDABLE REFRIGERATION SINCE 1882  
**FRICK CO.**  
WAYNESBORO, PENNA., U.S.A.

## Guide to Stories Which Ran In the NEWS In 1957

**Editor's Note:** Following is a listing of some of the stories and articles which appeared in the NEWS during 1957. This is by no means a complete summary of all articles, but rather some of the more significant stories. They are noted by the headline under which they appeared and are classified by general subject matter.

Copies of some of the issues are still available at 40 cents for a single copy; ten or more copies, 30 cents each; 50 or more copies, 20 cents each. Please see the accompanying box for a listing of available issues.

### Air Conditioning

#### GENERAL

Introducing Youth to Air Conditioning, Refrigeration Careers (1) Engineering Technician, Professional, Service Engineer Seen 'Indispensable.' Jan. 7, p. 18.

How To Increase Merchandising Appeal—Sell 'Taste' Instead of 'Recipe,' Set Standards, Explain to Home-owner What Air Conditioned Comfort Means, Nessell Says. Jan. 14, p. 28. 70 Contractors Attend Fort Worth Talks on Improving Firm Profits. Jan. 21, p. 1.

The Difference Between Gross Profit and Mark-Up on Cost. Feb. 4, p. 14. How Contractor Cuts Time for Selling, Administration, Servicing. March 18, p. 22.

Closer Cooperation To Aid Air Conditioning In Govt. Seen as Symposium Result. April 15, p. 1. Defense Dept. Uses 'Climate Control

Solely To Improve Effectiveness of Total Defense Effort.' April 29, p. 18. ARI Publishes New Standard for Residential, Commercial, and Industrial Air Conditioning. Nov. 18, p. 6. Winter Operation of Cooling Towers, Evaporative Condensers—Can Bar, Control, or Remove Ice by Varying Use Method—Expert Suggests: Normal Circulation; Spray On, Fan Off; Spray, Fan Off, By-Pass Water. Nov. 18, p. 10. The Economics of Air Conditioning—What It Costs to Own and Operate Year-Round Systems and Efficiency Increases Needed to Recapture Costs (1). Nov. 18, p. 30.

Design and Operation of Low Voltage Thermostats—1. Nov. 18, p. 50. Design and operation of Low Voltage Thermostats—2. Design Features and Built-In Control Devices. Nov. 25, p. 6.

Air Distribution Requirements In Year-Round Air Conditioning—2. Fundamentals of Conditioned Air. Nov. 25, p. 11.

Air Distribution Requirements In Year-Round Air Conditioning—3. Fundamentals of Conditioned Air (Cont.). Dec. 2, p. 8.

Design and Operation of Low Voltage Thermostats—3. Design Features and Built-In Control Devices. Dec. 2, p. 17.

The Economics of Air Conditioning, What It Costs To Own and Operate Year-Round Systems In Apartment Buildings, Hotels, Motels, and Homes. Dec. 9, p. 10.

Air Distribution Requirements In Year-Round Air Conditioning—4. Fundamentals of Conditioned Air (Cont.). Dec. 9, p. 15.

Design and Operation of Low Voltage Thermostats—4. Selection of Heat Anticipator. Dec. 9, p. 20.

What Makes a GOOD Distributor? Favorable Financial Status, Attitude, Community Relationship, Service Organization, Location, Facilities Cited by York. Dec. 16, p. 6.

Air Distribution Requirements In Year-Round Air Conditioning—5. Fundamentals of Conditioned Air (Cont.). Dec. 16, p. 8.

Design and Operation of Low Voltage Thermostats—5. Two Stage Cooling Thermostats. Dec. 16, p. 13.

Design and Operation of Low Voltage Thermostats—6. Time-Controlled Room Thermostat. Dec. 23, p. 6.

Air Distribution Requirements In Year-Round Air Conditioning—6. Fundamentals of Conditioned Air (Cont.). Dec. 23, p. 12.

#### COMMERCIAL

Hospitals Find Air Conditioning Eases Patients, Combats Airborne Bacteria. Jan. 7, p. 28.

Hermetic Compressor Design, Development (3). Feb. 18, p. 26.

'Through-The-Window' Air Conditioning Controls Temperature In Transmission Plant. Feb. 25, p. 12. Giant Cooling Tower Handling 2,500-Ton System Cuts Hotel's Air Conditioning Water Bill 96%. Feb. 25, p. 41.

1-Hp. Room Unit Conditions 'Portable' Greenhouse for Forced Green Feed 'Bio-Catalyst' Cultivation from Seed to Grass. Feb. 25, p. 46.

Air Conditioned Sidewalks Are 'For Real' In Texas. Feb. 25, p. 70.

GSA Tells 7-Yr. Plan To Cool U. S. Buildings. April 8, p. 1.

How Supermarket Uses Air-Cooled Condensers To Cut Heating, Cooling (and Water) Costs—Circulating Condenser Air Above Ceiling Claimed To Permit Savings. May 6, p. 10.

Efficiency Gains with Air Conditioning Cited at Government-Industry Symposium. May 13, p. 26.

Calculation of Cooling Loads—Stoffer Explains Fundamentals To Figure Commercial, Residential Loads To Fit Job Closely; Outlines 24-Hour Home Load Calculation. May 20, p. 30.

Growth of Hospital Air Conditioning Poses Problem—How To Prevent Spreading Air-Borne Infections. June 3, p. 10.

Systems for Air Conditioning Existing Buildings Should Be Equal to New, Leopold Says. June 10, p. 14.

Mechanical Core Air Conditioning Packages Combined with Repetitive Ductwork Cuts Plant's Climate Control Cost. June 10, p. 19.

Churches: Important New Air Conditioning Market?—Sees Installations In New, Existing New York Churches Touching Off Coast-to-Coast Trend. June 24, p. 10.

Protestant, Catholic Churches In Kansas, New Orleans Get Conditioning. June 24, p. 10.

Deputies Uninsulated Ducts, Pontiac Church Gets More Air Conditioning than Expected. June 24, p. 11.

Cool Houses of God—Bigger Capacity Packaged Units Condition Worshipers. June 24, p. 12.

Problem In Using Reheat System for Summer Cooling Viewed; Suggest Undersizing Condensing Unit for Constant Use; Installing Time Relay Switch To Turn Off Blower Until Condensate Drains Away. July 8, p. 15.

System for Existing Office Building In West Texas Uses Outside Air, Positive Pressure To Prevent Infiltration of Sand and Cut Operating Costs. July 15, p. 6.

Contractor Can Use Short Form Heat Load Calculation, But Only for Pricing. July 15, p. 15.

Workers' Fatigue Relieved by Air Conditioning, Preliminary Studies by du Pont Would Indicate. Aug. 5, p. 8.

Heating, Cooling, and Ventilating Studio, Transmitter, and Offices of KCRA-TV In Sacramento, Calif. Aug. 5, p. 12.

Air Conditioning System Must Be Designed for Specific Temperature, Humidity, Air Purity Range of Electronic 'Brain.' Aug. 19, p. 10.

New York Leads In Air Conditioned Bldgs. Rising or Planned But 6 Other Cities To Get Cooled Office Structures, Too. Aug. 19, p. 15.

Texas High School To Be Conditioned; School Chief Sees Portent of Trend. Aug. 26, p. 1.

Is Air Conditioning the Solution to Overcrowded Schools?—Symposium Looks at Benefits, Problems. Sept. 9, p. 6.

Chemical, Circulated Through Air Conditioner, Absorbs Formaldehyde In Clothing Stores, Eliminates Cause of Irritation. Sept. 16, p. 31.

Brochure Wins Tenant, Employee Co-

operation When Office Building Adds Air Conditioning. Sept. 23, p. 15. How One Firm Develops Air Conditioning Sales In 'Well Worker Over' Area. Sept. 23, p. 25.

Induction Conditioning Unit Needs No Changeover from Chilled to Hot Water. Oct. 14, p. 32.

Caterer Offers 'Outdoor Air Conditioning' Parties with 60-ton Portable Ice, Chilled Water Unit to Cool Yard. Nov. 4, p. 24.

Hotel's Built-In Air Conditioning System Permits Beauty In Design—Over 1,000 Fan-Coil Units, 30 Individual Systems Served by Two 350-Hp. Chillers. Nov. 18, p. 70.

#### RESIDENTIAL

What Happened In Residential Air Conditioning In Wichita During 1956? Sales Boom as 38 Contractors Install 1,165 Units In 10 Mos. Jan. 14, p. 26.

Fort Worth Installs 1,616 Cooling Units In Residences During 1956. Feb. 4, p. 1.

Significance of du Pont Residential Air Conditioning Survey to Dealers. Feb. 4, p. 6.

Contractor Converts Gravity Hot Air Systems to Year-Round Units Without Removing Ducts or Replacing Registers, Grilles. Feb. 25, p. 18.

'One-Call Close' Plan. Feb. 25, p. 30.

Use of Direct Mail: Get Good List, Schedule Mailing, Keep Records, Have Follow-Up Sales Technique. Feb. 25, p. 38.

Operating Costs of Residential Air Conditioning and What This Data Means to Dealers and Installers. Feb. 25, p. 72.

Selling for Profit (1). March 18, p. 48.

Selling for Profit (2). March 25, p. 8.

Experts Disagree on Proper Sizing of Home Cooling. April 1, p. 1.

Unusual Exhaust Fan Use Drops Home Cooling Load. April 1, p. 12.

Selling for Profit (3). April 1, p. 18.

Selling for Profit (4). April 8, p. 34.

Memphis Home Unit Sales Held In Cool Summer. April 15, p. 1.

Selling for Profit (5). April 15, p. 36.

Selling for Profit (6). April 22, p. 18.

Selling for Profit (7). April 29, p. 14.

Study Shows Added Mineral Wool Insulation Cuts Cost In Conditioned Home. April 29, p. 26.

What Happened In Cincinnati—1,042 Home Cooling Installations In '56 Surpasses '55 by 25%. May 6, p. 1.

Selling for Profit (8). May 6, p. 18.

Experts Offer Pointers on How To Figure Residential Air Conditioning Jobs. May 6, p. 35.

Sees 'Comfort Engineering' as Key to Central Cooling Market. May 13, p. 1.

Selling for Profit (9). May 13, p. 16.

Selling for Profit (10). May 20, p. 18.

Calculation of Cooling Loads—Stoffer Explains Fundamentals To Figure Commercial, Residential Loads To Fit Job Closely, Outlines 24-Hour Home Load Calculation. May 20, p. 30.

Growth of Hospital Air Conditioning Poses Problem—How To Prevent Spreading Air-Borne Infections. June 3, p. 10.

Air Conditioning Operating Costs Vary In Identical Homes Due to Human Factor, But It's Rare Owner Who Complains. June 3, p. 13.

Selling for Profit (12). June 3, p. 8.

Is 'Comfort Engineering' Key to Real Boom In Residential Air Conditioning? Could Slash First and Operating Costs, Shift Sales Pattern. June 10, p. 20.

The Women Like It (Part I) Year-Round Air Conditioning Is Approved Because: You 'Stay Home'; 'Have Hay Fever Relief'; 'Have Comfortable Kitchen.' June 10, p. 32.

Selling for Profit (13). June 10, p. 48.

Builds Residential Business from Scratch—Quality Product; Neat, Rapid Installation; Good Service Allow Former Lawyer to Pass Up Profitless Jobs. June 17, p. 6.

The Women Like It (Part II) Year-Round Air Conditioning Is Approved Because: 'Dog Likes It, Too'; 'Noise Lulls Us To Sleep'; 'It's Comfortable Because of Being Drier.' June 17, p. 30.

The Women Like It (Part III) Year-Round Air Conditioning Is Approved Because: 'We Can Stay Home In Summer'; 'There Is Hardly Any Dust'; 'Kids Rest.' June 24, p. 24.

Air Conditioning Gets Heating Dealer Into Variety of Application Problems. July 8, p. 10.

In Middle of Coal Field—Colorado Dealer Sells Home Air Conditioners, Gas Furnaces by Luring Prospects with Coal Furnace Parts. Aug. 12, p. 18.

Book Shelves Provide Keys to Installation—Contractor's Construction Knowledge, Favorable Home Design Result In Efficient Central Air Conditioning. Aug. 26, p. 6.

See West Coast Cooling Design Conditions as Different. Oct. 14, p. 34.

Importance of Sound Control In Residential Systems, New Way to Evaluate Noise. Oct. 21, p. 18.

What's Holding Back Residential Sales? Contractor's Files Indicate That Cut-Throat Pricing, Lousy Jobs Could Hold Back Industry for Years. Nov. 4, p. 1.

Wichita Survey Shows 12% Gain In Home Cooling. Nov. 18, p. 1.

Air Distribution Requirements In Year-Round Air Conditioning (1) Fundamentals of Conditioned Air. Nov. 18, p. 76.

Chemical, Circulated Through Air Conditioner, Absorbs Formaldehyde In Clothing Stores, Eliminates Cause of Irritation. Sept. 16, p. 31.

Brochure Wins Tenant, Employee Co-

#### Available Issues

For those who are interested in purchasing extra copies of the 1957 NEWS, issues for the following dates are available at 40 cents each or quantity rates: Jan. 14; Feb. 11, 25; March 11, 25; April 8, 22, 29; May 6, 13, 20, 27; June 3, 10, 17, 24; July 1, 8, 15, 22, 29; Aug. 5, 12, 19, 26; Sept. 9, 16, 23, 30; Oct. 7, 14, 21, 28; Nov. 11, 18, 25; Dec. 2, 9, 16, 23.

ASRE Forum Decrees Absence of Auto Conditioner Manufacturers. Look Into Overheating Problem at Low Speeds Brings Suggested Solutions. June 24, p. 4.

Selling Auto Air Conditioners—Small Ad Sells Out Dealer's Stock, Creates Backlog; Layaway Plan Stimulates Pre-Season Sales. July 22, p. 6.

Air Passes Radiator at Over 125°—Vapor-Lock Problem Due to Overheated Fuel Plagues Auto Conditioner Owners with Lower Fuel Volatility. July 22, p. 8.

#### ROOM UNITS

ARI Releases Room Unit Ratings of 15 Producers. Feb. 18, p. 1.

Talk of Complaints On Room Unit Ratings Is Not Verified, But ARI Will Set Procedure To Handle Same. March 11, p. 1.

Is 'In-The-Wall' Room Unit Better Way to Air Condition Multiple Dwellings? March 18, p. 32.

How To Use 'Climatic Odds' In Projecting Probable Air Conditioning Demand. March 18, p. 42.

Room Cooler Ad Standards Revised for N. Y. Area. March 25, p. 1.

21 Mfrs. Rate Room Units by Its Standard. ARI Reports Laboratory Approved for Testing. May 13, p. 1.

ASRE Provides Test Result for 'One Piece of Equipment'; ARI Applies Results To Get 'Published Rating on Line.' May 13, p. 8.

ARI Tabulates 22 Mfrs. Room Air Conditioner B.t.u.h. Ratings; Some Add New Models, Others Revise Previous Ratings. May 20, p. 36.

Forecasters See 2,000,000 Room Unit Sales In '57 Release Survey Data on Preferences, Trends, Buying Factors. June 10, p. 12.

Room Air Conditioner Dealers Advised To Return to Basic Approaches of Health, Comfort Instead of Low, Low Price. Aug. 19, p. 7.

FHA Relaxes Attitude Toward Residential Air Conditioning. Will Include Room Units In Valuation. Aug. 26, p. 1.

Offers 8 Methods to Cut

## Guide to 1957 News Stories--

(Concluded from preceding page)

Winter Air Conditioning Fundamentals (6). Aug. 5, p. 30.

Oil Burner Nozzles: How Do You Determine Air Pattern? What Is Remedy for Pulsation? What Is Proper Setting on Draft? Where Should Spray Pattern Hit? Aug. 5, p. 31.

'Increased Productivity' Seen as Solution to Contractor Profit Problem. Sept. 2, p. 10.

Winter Air Conditioning Fundamentals (7). Sept. 2, p. 20.

What Wholesaler Expects from Manufacturer. Sept. 16, p. 18.

Boyd Says Advantageous To Add More Insulation with Electric Home Heating To Cut Heat Loss. Also Reduces Cooling Needs. Sept. 16, p. 23.

Fuel Dealers Challenged To Get Into 'Natural Business'—Air Conditioning. Oct. 7, p. 16.

'Living Laboratory' Tests 'Comfort Curtain' School Heating System. Oct. 7, p. 18.

Winter Air Conditioning Fundamentals (8). Oct. 7, p. 19.

Winter Air Conditioning Fundamentals (9). Nov. 4, p. 29.

### STATISTICS

Sees 10 Million Homes Air Conditioned Within 5 Years. Feb. 18, p. 13.

Air Conditioning, Champion Growth Industry. Looks to Biggest Year In '57. Feb. 25, p. 1.

New Orleans—A Look at the Cooling Market. Feb. 25, p. 14.

Detroit Air Conditioning Sales. March 18, p. 58.

Study Shows Added Mineral Wool Insulation Cuts Cost In Conditioned Homes. April 29, p. 26.

'57 Cooling Sales Hold Up Well In View of Conditions; Unitary Sales Not Too Far Below '56. Nov. 4, p. 1.

Auto Cooling Installations Surprise Mfrs. Nov. 11, p. 1.

Mfrs. '56 Packaged Cooling Shipments Up 1/2 over '55, Census Bureau Says. Dec. 16, p. 1.

## Commercial Refrigeration

### GENERAL

Commercial Distributor's Customer Services Are Varied. Feb. 11, p. 14.

Frozen Food Handling. Feb. 18, p. 4.

'Accrual' Accounting Reflects Contractor's True Earnings. March 11, p. 19.

Layout of Processing Area Equal to Fixtures; Receiving, Pricing, Stocking to Benefit. March 25, p. 16.

'Mom and Pop' Food Stores. March 25, p. 18.

Says Distributor Needs Qualified Manager, Teamwork In Service Department, Simple Record System, Normal Parts Stock, Training Plan. April 22, p. 32.

Problems with Refrigeration Men—Market Operator Offers 'Solid' Ideas to Improve Relations—What Serviceman Can Do When He Comes to Store; How to Present Bill. Aug. 26, p. 20.

'No Get-Rich-Quick Scheme'—Renting Commercial Ice Makers Works Advantageously for Dealer; Steam Cleaning Units Offers More Prospects. Sept. 16, p. 26.

### APPLICATIONS

How Supermarket Uses Air-Cooled Condensers To Cut Heating, Cooling (and Water) Costs—Circulating Condenser Air Above Ceiling Claimed to Permit Savings. May 6, p. 10.

Overhead Tracks Eliminate Need for Wide Storage Area Aisles In Large Supermarket; Refrigerated Cases, Wide Gondolas, Compact Coolers Cut Storage Space About 1/4. May 27, p. 33.

Roadside Stands Are Prospects for Ice Cream Mixers, Freezers, Air Conditioning Units. June 17, p. 33.

Capitalizes on Showroom—Dealer Pushed Used Equipment Sales to 15% of Gross by Applying New Fixture Merchandising Techniques. June 17, p. 34.

Store Tries All Air-Cooled Units To Cut Costs. June 24, p. 34.

Contractor Tries Something Different:

1. Puts Cooling Tower In Back Room, 2. 1-Hp. Pump Supplies Water for 6 Units. June 24, p. 36.

Cooling Coil Icing Cited as Problem In Dehumidification; One Solution: Below 65° Set Back-Pressure Regulator Valve at 32°; 5 Characteristics of Adsorbent's Practicability Offered. July 1, p. 14.

33-Ft. Wide Market Packs In Modern Features, Installs All Air-Cooled Equipment. July 15, p. 30.

Dual Systems for Big Supermarket Warehouse Cost More But Insure Against Loss of Food. July 22, p. 26.

Refrigeration Ups Chip Steak Output: 24-In. Frozen Meat Logs Are Sliced Into Steaks To Get 10 Times More Production with Only 3 More Workers. July 29, p. 7.

Below 35° Temperature Better for Most Fresh Food Preservation But Must Be Well Controlled To Halt Freezing. July 29, p. 18.

Find Refrigerated Bulk Milk Dispensers Satisfy Wis. Schools; Trouble-Free Units Raise Consumption, Lower

Cost, Streamline Service. Sept. 9, p. 12.

Refrigeration Controls Reactor Temperatures In Synthetic Rubber, Plastic Plant. Sept. 23, p. 8.

Refrigerated Display Fixtures Have Average Useful Life of Only 7 Years. Supermarkets Report. Sept. 23, p. 20.

5 Points for Proper Drain Pipe Installation—Expert Decries Improper Case Drainage, Inadequate Planning In Supermarket Layout as Serviceman's Chief Headaches. Sept. 23, p. 22.

Refrigerated Trailer Rating—Study Shows Comparison of Highway Rating with Laboratory Rating Remarkably Consistent. Oct. 14, p. 29.

Color Styling of Commercial Refrigerators Proving Worth as Food Store Sales Builder. Oct. 28, p. 16.

Color Compatibility In Food Store Fixtures, Decor Ups Impulse Buying. Oct. 28, p. 28.

Refrigeration System Design for Food Markets: In the Far West, 'Racked' Hermetic Units with Closed Water System Evaporative Condenser Is New Approach. Nov. 18, p. 54.

### STATISTICS

CRMA Reports Low Temp Cases Share of Volume Tops '56—New High 32.2% Ratio Shows Greatest Gain In Whole Product List. March 25, p. 1.

Census Bureau Reports Refrigeration Unit Sales, Statistics for 1955. Aug. 12, p. 30.

### Frozen Foods

#### FREEZERS, LOCKERS

Frozen Food Handling. Feb. 18, p. 4.

Handling Frozen Meats—Restaurateurs Advised To: Hold Temperatures at 0° F. or Lower; Avoid Thawing, Re-freezing; and Minimize Temperature Fluctuations. July 29, p. 6.

Aims To Get Freezers Moving Through Dealers—Shows Dealers How To Make Prospects 'Thirsty' for Freezer Living Following Specialty Selling Formula. Sept. 9, p. 23.

### STATISTICS

Frozen Food Production Upped 4 1/2 Times Since '46; Agriculture Dept. Sees 'Large' Increases Coming. Jan. 7, p. 13.

Domestic Freezer Sales In '56 Split 51-49% Between Chests, Uprights. May 6, p. 9.

NEMA Reports Freezer Sales Up for Second Month In Row Over '56. Sept. 16, p. 11.

### Household Appliances

#### STATISTICS

Manufacturers Sell 3,700,000 Refrigerators—NEMA. Mar. 4, p. 1.

'56 Refrigerator, Freezer Distributor Sales by States Outlined by NEMA. May 13, p. 23.

NEMA Estimates Total Industry Refrigerator Sales In April Reach 281,600; Freezers 70,900. July 8, p. 8.

NEMA Reports Home Freezer Sales Up for Second Month In Row Over '56. Sept. 16, p. 11.

NEMA Reports Distributor Percentages—Calif. Tops In Freezer, Second In Refrigerator Sales In First Half. Oct. 14, p. 31.

### Trade Codes, Regulations

#### (NON-FEDERAL)

#### LEGAL NEWS

Gerteis Says Electrical Code Revisions Needed on Hermetic Motor Developments. Jan. 14, p. 15.

Air Conditioner Use Causes Changes To Modernize N.Y.C. Electrical Wiring Laws. Jan. 28, p. 4.

Would Standardize Milk Sanitation. May 6, p. 1.

Model Code: Completely Indexed Proposed 'Blanket' Code Fulfills 8 Needs, Would Raise Standards. May 20, p. 2.

Inspector Tells Why Revamped Shreveport Code Levies Steep Refrigeration, Air Conditioning Fees, Sets Up 3 Classes of Contractors. June 10, p. 24.

12 Detroit Heating Contractors Take Restricted Refrigeration License. July 1, p. 1.

NEPA Orders Two Non-Home Cooling Standard Changes. July 15, p. 1.

Utility Sets Home Heat Pump Rules. Aug. 12, p. 1.

Text of Standard for Household Refrigerator Safety Device. Aug. 19, p. 28.

AMCA Outlines Air Moving Unit Ratings Program. Sept. 30, p. 1.

3-Year Agreement Features Journeyman Training Plan. So. Calif. RACCA-UA Push National Plan. Dec. 9, p. 1.

Labor-Management Cooperation. New Jersey RACCA-UA Agreement Incorporates Elements of Modern, Enlightened Relations. Dec. 16, p. 20.

## Servicing GENERAL

Cooling System Contract Service and Maintenance Plans—Most Common Provide Inspection, Cleaning, Adjustment, Permits Service Firm Better Allocation of Man Hours, Cuts Chance of Loss. Jan. 21, p. 14.

Thermostatic Expansion Valve Selection. Feb. 4, p. 22.

Simpler Solenoid Valve Selection May Be Due. Feb. 11, p. 10.

28 Mechanics Needed for Each \$Million of Business, RACCA Survey Indicates. Feb. 18, p. 28.

Miami Firm Offers 'Hurricane Service' To Protect Exposed Air Conditioning Equipment. March 4, p. 26.

Air Flow Rate Best Indicator of When To Defrost Coil. March 11, p. 22.

Service Contracts (3 Types). March 18, p. 76.

ARI Prepares Several New Standards. April 8, p. 18.

Compression Boosts Glass-to-Metal Hermetic Sealing; Sees Advances Jumping Sales to \$50,000,000 by '62. April 22, p. 12.

N. J. Commercial System Service Pricing Survey. April 22, p. 36.

6 Refrigeration Service Notes, 5 Safety Precautions for Heating Men. May 6, p. 15.

Hotels Cautions Contractor To Be Well Established Before Offering Service Contract. May 27, p. 24.

Radio System Cuts Dealers 24-Hour Repair Operation 35%. June 10, p. 41.

Restaurant Owner's Check Lists Oiling What To Do To Care for Condensers, Drains, Fans, Defrosting Compressor Motors, Doors, Walls. June 24, p. 20.

'Day of One-Man Shop Gone'—Contractor Must: 1. Know Costs, 2. Delegate Responsibility. July 15, p. 16.

Contaminants In Refrigeration Systems (1) Excessive Motor Temperatures May Produce Breakdown Resulting In Moisture, Acetic Acid, Acetone, Tars. July 15, p. 28.

Contaminants In Refrigeration Systems (2) Problem of Cleanup After Motor Burnout Resolves Into Flushing Filtration, Adsorption; Mrs. Method Outlined. July 22, p. 14.

Motors, Motor Protection—Manufacturers, Contractors, Utilities Debate Use of 3-Phase, Single-Phase Motor Protection. July 22, p. 23.

Electric Service for Residential Systems—A Discussion of: Service, Voltage, Unbalance In 3-Phase Voltage, Need to Protect Against 'Single-Phasing' of 3-Phase Unit. Aug. 5, p. 10.

Improved Method To Test Desiccants, Driers; Use Drier, Refrigerant In Recirculating Unit. Nov. 11, p. 24.

Method of Keeping Chrysler Auto Cooling Systems Dry Described: 'Moisture Content In Usual System Should Be Under 10 Parts Per Million.' Nov. 11, p. 30.

Groups, Men Who Repair Durable Goods Are 'Ill-Trained, Overcharge'; Shortage Hurts Consumer, Time Survey Indicates. Nov. 18, p. 46.

Builds \$1,000,000-a-Year Business—Two Full Tool Sets Help Distributor Pay Close Attention to Service, Get Large Food Chain Jobs. Nov. 18, p. 52.

Factors In Selecting Scale Removers—Study Among Servicemen Reveals New Methods In Scale Remover Use, Service Operation Trends. Nov. 18, p. 60.

Repair Techniques Enable Firm to Meet Specifications, Keep Units Moving, Provide 48-hour Service on Air Conditioning Units. Nov. 18, p. 62.

### AIR CONDITIONING

Hermetic Compressor Design, Development (1). Feb. 4, p. 50.

Hermetic Compressor Design, Development (2). Feb. 11, p. 32.

Warranty Certificate Sets Standard for 'Free Service' on Refrigeration Units

for Cooperating Contractors. Feb. 25, p. 26.

Service Charges, Parts Markups, Maintenance Contract Costs. Feb. 25, p. 34.

Remote Air-Cooled Condensers—Methods To Assure Proper Head Pressure. Feb. 25, p. 58.

Advice on Cleaning Cooling Towers, Ice Makers. Feb. 25, p. 66.

Assembly Line, Unusual Techniques Used In Repairing Window Units. March 18, p. 61.

Don Landis Gives Pointers on Installing, Servicing Attic Home Air Conditioners, Other Cooling Equipment. June 10, p. 46.

How To Avoid Pitfalls In Air Conditioning Service Work (1) Service Operator Develops Answers, Finds Part-Time Help for Summer Rush. Oct. 14, p. 18.

How To Avoid Pitfalls In Air Conditioning Service Work (2) Finds Good Source of Service Contract Work In Residential Air Conditioning. Oct. 21, p. 10.

Pay Later Contracting Service Aimed to Bring Homeowners Speedy, 24-Hour Repair Service of All Kinds In N. Y. Nov. 11, p. 20.

Installation, Service Facilities Titled Key to Success—'Clogged Filters, Fan, Motor Bearings Run Dry, Stretched, Frayed Belts, Refrigerant Leaks, Continuous Overload All Punish Air Conditioners.' Nov. 18, p. 18.

Servicing Air Conditioners Costs More Than Furnaces, Heating Wholesalers Told. Dec. 16, p. 7.

# Air Distribution Requirements In Year-Round Air Conditioning

## 7. Fundamentals of Conditioned Air (Cont.)

Frank Klein has been associated with the air conditioning and refrigeration industry for over 20 years. An engineering graduate of the University of Michigan, he has held executive positions with a number of leading manufacturers, and has served as a consultant to both manufacturing and distributing firms, in the heating as well as the cooling field.

By Frank D. Klein, Chief Engineer, Govenair Corp.

From a previous discussion it will be recalled that the other component of the Total Heat is the Sensible Heat. Sensible Heat is the type of heat which can be transferred from one body or substance to another and in so doing establish the temperature of that substance or body to which the heat is transferred. This type of heat manifests itself to the human sensory system.

### 'Must Control Sensible Heat, Too'

In cooling, the Air Conditioning Engineer must control Sensible Heat as well as Latent Heat with equal facility. The use of Sensible Heat as a counterbalance to Latent Heat is of equal importance in the heating cycle. For example:

1. What amount of Sensible Heat in B.t.u. is required to heat 1,000 cu. ft. of an air atmosphere from 0° F. to 70° F.?

a. The Density of the air atmosphere at 0° F. must be established. By referring to tables available in the ASHAE Guide or any similar source, it will be found that air at 0° F. has a density of 0.086. (Dry.)

b. The density must be found for the top level of heat or 70° F. By referring to the same tables it will be found that air has a density of 0.075 (Dry) at 70° F.

c. The average density must be established between the two, thus the addition of one to the other, then divided by two is 0.0805 lbs. per cu. ft.

d. Since the total volume to be heated amounts to 1,000 cu. ft.:  $1,000 \text{ cu. ft.} \times 0.0805 = 80.5 \text{ lbs.}$

e. From the tables on The Specific Heat of Air, it will be found that the Specific Heat is 0.24 B.t.u. per lb., per degree.

f. The Temperature rise is 0-70° F., or 70°.

g. Therefore the answer is:  $80.5 \times .24 \times 70 \text{ or } 1,352.4 \text{ B.t.u.}$

On the other hand reverse the procedure as in the Cooling Cycle with the following example:

1. What amount in B.t.u. of Sensible Heat must be removed to cool 1,000 lbs. of an air atmosphere from 100° F. to 80° F.?

a. The formula is:  $1,000 \times (100 - 80) \times 0.24 \text{ or } 4,800 \text{ B.t.u. Sensible Heat.}$

In explanation of the above I have used a new term "Specific Heat." Different substances of course possess different Specific Heat. Specific Heat is the amount of heat in B.t.u. that must be added to or subtracted from each pound of a substance to change its temperature 1° F. The Specific Heat of air is the heat in B.t.u. necessary to raise the temperature 1° F. at constant pressure or constant volume.

### 'Link Humidity, Temperature'

To the air conditioning engineer, regardless of the cycle, Temperature and Humidity are synonymously linked when calculating for the comfort zone. Important points of observation in this relationship of temperature to humidity are the Wet Bulb and Dry Bulb Temperatures.

The ordinary "temperature" that most people observe is of course the Dry Bulb Temperature, which can be obtained with any accepted ordinary thermometer. These thermometers are unaffected by the moisture content or humidity present in the air atmosphere. Actually such a measurement is

the measurement of the Sensible Heat only. It does not reflect the Total Heat in the air.

When the Dry Bulb temperature reads, let us say, 95° F. it is revealing only the sensible portion of the total heat and reflects nothing whatsoever the condition of comfort at this temperature.

A 95° F. thermometer reading may be quite tolerable to human beings under low humidity conditions; on the other hand such a temperature can become exceedingly intolerable at high humidity conditions. The Dry Bulb in this case could remain constant, with varying degrees of water vapor present in the air contributing to a variable humidity condition.

### Water Vapor Holds Heat

Water Vapor in the air just like water itself, will hold a certain amount of heat which is subject to change with the temperature; increase the quantity of water vapor in an air atmosphere and you accomplish an increase in Total Heat. Thus though the Dry Bulb Temperature remains the same, an increase in humidity can only be due to a corresponding amount of water vapor.

As we can see then, the Dry Bulb Temperature is no indicator of comfort. However, the Dry Bulb Temperature is an indication of how much an air atmosphere will tolerate in water vapor. This will be remembered from the examples given in Table I, of the first instalment. For instance 1 cu. ft. of air will hold 0.5 grains of moisture at 0° F., but at 100° F. it will hold about 20 grains.

The Wet Bulb Temperature on the other hand is actually the temperature of evaporation. The Wet Bulb temperature becomes the lowest surface temperature water can assume in evaporating into free air. We know from our previous discussion that to evaporate water surfaces at any temperature we must have latent heat involved.

Thus if we have a surface of water at one temperature and we pass hot air or air at a hotter temperature than that of



TYPICAL PLOTTING, in the laboratory, of the psychrometric properties of an air atmosphere. Note presence of the Barometer, and particularly the stationary Psychrometer (Dry and Wet Bulb Thermometers) to the right of the technician. The Psychrometric chart is covered with 3/8 inch Plexiglass thus allowing plotting to be done with wax pencils in color, and subsequent erasing for a new problem. (Courtesy the Folsom Co., Dallas, Texas.)

the water surface over the face of its surface we will accomplish evaporation. However, when we pass this hot air over the surface of the water it in turn yields its heat, in turn assuming a different and lower temperature than it possessed originally. This process of conversion involves the change from sensible to latent heat.

The common example of this process is the use of stationary or sling Psychrometer, which involves two thermometers, (1) a Dry Bulb Thermometer and (2) a Wet Bulb Thermometer. They are similar except that the Wet Bulb has a "sock" or wick around its bulb which is wetted.

Thus the Wet Bulb measures the Total Heat, which is always constant at long as the wet bulb is constant. Furthermore

the Wet Bulb reading is also the saturation temperature at which the Total Heat is equal to the total heat of the air atmosphere bearing water vapor which it records.

On the basis of the foregoing we have up to this point built our bridge of understanding to comprehend the true meaning of the Effective Temperature, a true analysis of The Comfort Zone, a constant actually with in a constant.

In the next instalment will begin the application of all of the basic fundamentals discussed thus far to the practical evaluation of this Comfort Zone and how the behaviors we have investigated thus far play their part in constructing the Effective Temperature.

(To Be Continued)

**HOLDOVER FOR STOPOVERS!**

**DOLE**  
**Truk-Cel**

**EUTECTIC BLOWER UNITS**

A compact holdover blower system that maintains uniform temperature in any high temperature truck body.

- Easily installed, simple in operation
- Sanitary, compact, light in weight
- Utilizes a minimum of floor space

**DOLE REFRIGERATING COMPANY**  
5920 NORTH PULASKI ROAD, CHICAGO 30, ILLINOIS  
103 PARK AVENUE, NEW YORK 17, N. Y.  
In Canada: Dole Refrigerating Products Limited, 44 Elgin St., Brantford, Ont.

Write for Engineering Catalog CBE

**Truk-Cel** EUTECTIC BLOWERS



## Handy Way to Subscribe

### To See the Industry In Action EVERY WEEK

Keep up-to-date on what's going on in your industry. You'll see action weekly in **AIR CONDITIONING & REFRIGERATION NEWS**. Covers latest news and gives you top how-to-do-it reports on commercial and residential air conditioning, heating, commercial and home refrigeration: manufacturing, contracting, distributing, retailing, and servicing. Read the industry's newspaper for profit every week. Only \$6.00 per year, 52 issues (U.S. and Canada). Foreign: \$10.00 per year.

**AIR CONDITIONING & REFRIGERATION NEWS**  
450 W. Fort St., Detroit 26, Mich.

Send the NEWS every week for:  One Year \$6.  Three Years \$12.  
 Payment Enclosed  Bill Me  Bill Company

Name.....  
Company.....  
Street.....  
City..... Zone..... State.....

IMPORTANT: Company's Type of Business.....

**Refrigeration**

**Air Conditioning**

**Electric Motors, Too!**

**PARTS and SUPPLIES**

Over 10,000 items...most complete list in the world... carried in stock! You'll find them all in the NEW Harry Alter Dependabook No. 167 for Fall-Winter, 1957-58.

SAVE MONEY, time, effort by ordering from this complete catalog. WHOLESALE ONLY

**The HARRY ALTER CO., Inc.**

Chicago 16, Ill. New York 13, N. Y. Dallas 7, Tex. Atlanta 10, Ga.  
1717 S. Wabash Ave. 134 Lafayette St. 122 Parkhouse St. 690 Stewart Ave., S.W.

FREE PARKING AND FAST COUNTER SERVICE AT THESE 4 BIG HOUSES

Write on your letterhead for the DEPENDABOOK

**The HARRY ALTER CO., Inc.**

Chicago 16, Ill. New York 13, N. Y. Dallas 7, Tex. Atlanta 10, Ga.  
1717 S. Wabash Ave. 134 Lafayette St. 122 Parkhouse St. 690 Stewart Ave., S.W.

FREE PARKING AND FAST COUNTER SERVICE AT THESE 4 BIG HOUSES

## N. Y. Refrigeration Code--

(Concluded from Page 1, Col. 5) sition from the operating engineers and failed. But the code, as adopted, received their approval and support.

Witte outlined the features and advantages of the code for Mayor Wagner.

### Experience with Refrigerants

"Perhaps the most outstanding departure from our present law," Witte said, "which was written at a time when refrigerants were almost exclusively poisonous, irritating and explosive gases, is the recognition of almost 25 years' experience with 'Freon'-type refrigerants which are non-toxic, non-irritating, and non-flammable, and which currently are employed in over 90% of all operating refrigeration and air conditioning systems."

### 2nd Feature

"Second outstanding feature, a tremendous safety advance over existing provisions, is the basic idea that the permissible quantity of any refrigerant in a system shall be governed by the cube of the space in which the unit is located or which it serves, thus insuring safe dissipation of the refrigerant in case of accident.

"The presently provided unrealistic arbitrary maximum quantities, hinged on the type of occupancy of the space served and wholly unrelated to safe dissipation, are eliminated.

### Provides Rigid Standards

"The third major accomplishment from the safety standpoint is inherent in the very job of modernization of the law. Rigid modern standards for the construction and installation of all equipment, are provided, assuring proper and safe installation of properly engineered units.

"As a corollary of these three basics and flowing from them are a plethora of advantages, including flexibility of system design, elimination of unnecessarily costly installations, wider use of direct type air conditioning systems which are cheaper to manufacture and install, and the removal of the necessity of uneconomic usage of multiple small separate units where one would serve with greater efficiency.

"On the administrative side, fee schedules have been revised and machinery set up for prompt departmental inspections upon installation.

"The code transfers to the fire department, where administration of all other provisions of the safety code are lodged, jurisdiction over refrigeration system operators where such operators are required.

"While continuing the re-

quirement for operators, amendment is made to upgrade the point at which they are needed on new equipment only, thus giving recognition to modern installations complying with the new safety code."

### Need Permit To Use, Maintain Systems

The new code requires a permit to maintain and operate all refrigerating systems except residential systems, those installed in vehicles, vessels, or railroad cars, and those employing water or air as a refrigerant.

Annual fees for permits are as follows:

For each system having a compressor or prime mover of 1 hp. or less, \$2; more than 1 hp. through 3 hp., \$5; above 3 hp. through 5 hp., \$10; above 5 hp. through 30 hp., \$20; and above 30 hp., \$50.

To maintain or operate each carbonated beverage dispenser, \$6; and refrigeration repair shop, \$10.

Permit applicant is to notify the fire department upon completion of an installation or alteration and the department will cause an inspection to be made.

### 'Will Shut Down Hazardous Installation'

If the installation is found hazardous to life or property, it will be shut down until corrected. If approved, the permit will be issued and posted adjacent to the premises.

The code requires the supervision of a qualified operating engineer for all non-automatic refrigerating systems using more than 50 lbs. of refrigerant and automatic systems containing more than 200 lbs. of refrigerant, with two exceptions.

An automatic system is defined as one whose regulating and safety devices are automatically actuated once the system is in operation.

The exceptions are found in systems installed in other than industrial occupancies for any purpose and in industrial occupancies for purposes of human comfort cooling, and using Group 1 refrigerants except carbon dioxide.

For such systems installed after June 1, 1957, operating engineers are required on those having a prime mover or compressor in excess of 50 hp. or its kilowatt equivalent.

### When Operating Engineers Are Needed

For combinations of such systems totaling more than 100 hp. or its kilowatt equivalent based on individual systems of more than 15 hp. each, operating engineers are required when the systems are used for human comfort air conditioning within a single building and are under the sole direct control of a single occupant, lessee, or owner.

Only one qualified operator is required for fully automatic systems containing 200 lbs. or less of refrigerant. No operator shall be required when a mechanical refrigeration system is not in operation.

Certificates of qualification are issued to operating engineers by the fire commissioner

after the department of personnel has certified that the applicant is qualified to operate a refrigerating system and has furnished proof that he is a citizen of the United States.

For his initial certificate, the operating engineer pays a \$9 fee for a term of three years. Renewals, to be made within 30 days prior to expiration of the certificate, are \$6.

Those engineers currently holding valid authorizations from other departments of the city are also entitled to certificates of qualification.

Henry Strong, executive secretary of the Refrigeration Industry Safety Advisory Committee, commented that the adoption of the ASA B9.1 code by the city of New York, does not mean the end of industry efforts toward code improvement or toward broader adoption of its provisions.

## Heat Pump To Heat, Cool Portland Hotel

PORTLAND, Ore.—Construction is expected to begin in late January or early February on the Portland Sheraton, claimed to be the first hotel in the United States heated and cooled by heat pump.

Heat source will be two 270-ft. wells, one of which has already been successfully sunk.

Facing Holladay park opposite the Lloyd shopping center, the eight-story, 300-room luxury hotel is expected to cost about \$7 million. Opening is scheduled for spring of 1959.

## • 58 Housing --

(Concluded from Page 1, Col. 3)

Liberalizing the FHA trade-in house program by eliminating at least 50% of present closing costs.

Public Housing Administration Commissioner Charles E. Slusser talks of new policies such as putting single family housing on single lots scattered through a city, and renting apartment houses for low income families and subsidizing the rent.

Creation of a Defense Housing Corp. to issue debentures for funds to erect military family housing.

Repeal of present laws on discounting FHA and Veteran's Administration mortgages.

## School Offers Cooling, Refrigeration Courses

### Hildebidle Heads Mathes

AIR CONDITIONER and heat pump manufacturer, The Mathes Co. of Fort Worth, Texas, a Glen Alden Corp. subsidiary, recently named John J. Hildebidle as executive vice president and head officer. The Mathes family is no longer connected with the firm.



## Air Pollution Possible Cause of Lung Cancer?

NEW YORK CITY—Air pollution in cities was tagged as another possible cause of lung cancer.

Dr. Leonard Greenburg, New York City commissioner of air pollution control, recently told the Mid-Atlantic states section of the Air Pollution Control Association, that benzopyrene, a compound that can produce cancer in man and animals, has been found in the atmosphere of Los Angeles and many other cities.

Something associated with the use of combustion engines is increasing the benzopyrene content of the air in our cities, Dr. Greenburg said.

He cited British statistics showing that among men who do not smoke, the lung cancer rate is nine times greater in cities than in rural areas.

## President Eisenhower Releases \$177,000,000 For Mortgage Buying

WASHINGTON, D. C.—President Eisenhower has requested the Budget Bureau and the Federal Housing Administration to unfreeze \$107 million for buying mortgages on armed services housing by the Federal National Mortgage Association, \$50 million for capital grants for urban renewal projects, and \$20 million for cooperative housing mortgages by the Fannie Mae agency.

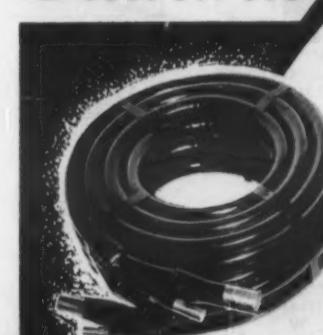
In this move to make available \$177 million of heretofore frozen funds to pump into the housing industry, the President has asked the two agencies to release funds authorized by Congress last year as part of its omnibus housing bill which is now law.

## Edwards CO-AXIAL FREON CONDENSERS

### A NEW REFRIGERANT CONDENSER

with these advantages:

- COST REDUCED 30% TO 40%
- CONDENSER WATER REDUCED 35%
- Refrigerant Charge Reduced
- Stabilizes Capillary Performance
- Smaller Cooling Towers Required
- Shipping Weight Reduced
- Many Shapes and Sizes Available (1 to 7½ tons)



USED BY MAJOR EQUIPMENT MANUFACTURERS  
Contact our engineering department for FREE technical assistance, regarding your specific installation requirements.

Send for catalog TT-653 TODAY

EDWARDS ENGINEERING CORP.

103 ALEXANDER AVENUE • POMPTON PLAINS, NEW JERSEY

Telephone TERHUNE 5-2808

## MARSH Instruments

THE SERVICEMAN LINE of Testing Gauges, Testing Thermometers, Timers, etc.  
PRESSURE GAUGES and Dial Thermometers for all services.  
MARSH-ELECTRIMATIC, Water Regulating Valves, Solenoid Valves.  
MARSH INSTRUMENT COMPANY  
Sales Affiliate of Jas. P. Marsh Corporation  
Dept. D, Skokie, Ill.



BEST WISHES  
FOR A  
HAPPY  
AND  
PROSPEROUS  
NEW YEAR  
FROM  
THE STAFF  
OF  
**KESCO**  
AUTOMATIC  
CONDENSATE  
WATER DISPOSAL PUMPS  
JAMAICA 13, N. Y.

Operating Costs of Residential Air Conditioning and What This Means to Dealers and Installers. By R. A. Gonzales—25¢ each.  
Get your copy Mail this ad with your name and address to: Air Conditioning & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.

## CLASSIFIED ADVERTISING

RATES for "Positions Wanted" \$7.50 per insertion. Limit 50 words. 15¢ per word over 50.

RATES for all other classifications \$10.00 per insertion. Limit 50 words. 20¢ per word over 50.

ADVERTISEMENTS set in usual classified style. Box addresses count as five words, other address by actual word count. Please send payment with order.

### POSITIONS WANTED

EXECUTIVE—ENGINEERING and/or manufacturing. Mechanical engineer with 23 years' experience in designing and manufacturing of heating, cooling, ventilation, air conditioning and refrigeration products and associated components. Familiar with all phases of manufacturing and production functions including processing, tooling, material and production control, procurement, personnel and accounting. 10 years of plant management experience in fast growing concerns. Prefer small or medium sized operation with potential and resources for expansion. BOX A5923, Air Conditioning & Refrigeration News.

### POSITIONS AVAILABLE

SALES ENGINEER: Excellent opportunity in expanding OEM sales department of well known manufacturer of control valves and devices. Engineering education desirable. Development or application experience in refrigeration, air conditioning, or heating essential. In reply state education, experience, earnings, personal data. Interviews arranged with qualified applicants. Replies held in confidence. BOX A5944, Air Conditioning & Refrigeration News.

MANUFACTURERS' REPRESENTATIVES: Contacting architects, engineers, contractors and industrials wanted by small eastern manufacturer quality line packaged air conditioners and chillers to 25 tons. Larger units will be developed; additional products being developed. Several choice territories open. Write qualifications and lines handled to BOX A5943, Air Conditioning & Refrigeration News.

DISTRICT SALES Manager. Large nationally known manufacturer of a complete line of condensing units and all popular size packaged air conditioners, residential and commercial. Permanent position, salary, car, expenses, commission. Must be willing to travel well established territory, part of Alabama, Georgia and Florida. Dealer contacts. Experience in this field necessary. State age, education, past connections first letter. All of our employees know of this ad. BOX A5942, Air Conditioning & Refrigeration News.

LARGEST CARRIER air conditioning & heating contractor in Northeastern Ohio wants an experienced air conditioning man. Must know service, installation, design and engineering applied air conditioning installations. Send in application with inquiry stating experience, background and desired salary. BOX A5941, Air Conditioning & Refrigeration News.

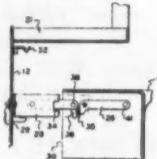
SERVICE MAN—Air Conditioning & Heating—Carrier Equipment. Upstate New York. Small Company—wonderful opportunity. BOX A5940, Air Conditioning & Refrigeration News.

AIR CONDITIONING Project Engineer. Rapidly expanding Michigan manufacturer of air conditioning equipment needs experienced project engineer familiar with the design and

## PATENTS

### Week of Oct. 1 (Continued)

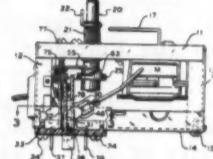
2,808,310. REFRIGERATOR CABINET CONSTRUCTION. Le Roy E. Patterson, Jr., Erie, Pa., assignor to General Electric Company, a Corporation of New York.



1. A refrigerator cabinet including an excess opening and a door for closing said opening and including an inner wall, a plurality of storage containers mounted on said inner wall one above another, and including a first container positioned beneath a second relatively wider container, means for pivotally supporting said first container on said inner wall for movement between a storage position

adjacent said inner wall with the top of said first container beneath and closely adjacent the bottom of said second container and an access position spaced downwardly from said second container and forwardly from said inner wall, said supporting means including a bracket secured to said inner door, stop means on said bracket, a pair of parallel links pivotally connecting an end wall of said first container to said bracket, said links being connected to said first container above the center of gravity of said container and arranged so that when said first container is in said storage position said links extend upwardly from said bracket and slightly over-center. . . .

2,808,478. CONTROL APPARATUS. John Lieberman, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio.



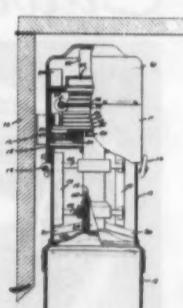
1. Control apparatus comprising first and second engageable contact members movable relative to one another to make and break an electric circuit therethrough, means including a cam to move said first contact member in opposite directions alternately, both of said contact members being moved to one position together by said means, a latch movable transversely of the direction of movement of said second contact member to thereby engage an edge portion thereof and retain said second member in one said position, and means including a cam synchronized with the first mentioned cam for moving and maintaining said latch out of range of movement of said second member during movement of said contact members to said one position and for moving said latch to its contact member latching position prior to movement of said first contact member from one said position whereby said first contact member is moved from said second contact member.

2,808,488. AIR CONDITIONING UNIT CONTROL. Samuel J. Levine, West Orange, N. J., assignor to General Electric Company, a corporation of New York.



1. A pressure responsive switching mechanism comprising an electric switch having an operating arm, an expandable chamber device having a movable wall member, means dependent upon a predetermined fluid pressure in said device for utilizing movement of said wall member to actuate said switch arm, means for biasing said arm against such movement, a movable stop for said switch arm having a first position for limiting the movement of the arm by said biasing means of said arm, means for moving said stop to a second position against said biasing means to actuate said switch, spring means for biasing said stop to said first position, and means on said stop for engaging said switch arm and retaining said stop in said second position and affording release of said stop and return to said first position upon operation of said switch arm by said expandable chamber device.

2,808,706. AUTOMATIC ICE CREAM FREEZERS. Lee C. Updegraff, White Plains, N. Y. Application April 13, 1955, Serial No. 501,125. 15 Claims. (Cl. 62-4).

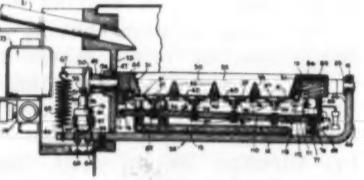


1. The combination with a food freezing cabinet, of a dessert freezer, comprising a casing, means for supporting the casing within the freezing cabinet, a freezing compartment in the casing, a motor driven dasher unit within said compartment, means responsive to a predetermined consistency of the frozen mixture to stop the dasher unit, means for separating the partially frozen mixture and the dasher unit, and a chilling chamber located below the dasher unit for storing the partially frozen mixture for final freezing.

Editor's Note: Patents described here have been selected from the "Official Gazette" of the United States Patent Office. They offer only a brief summary of each invention. In some instances only the first part of the digest is presented.

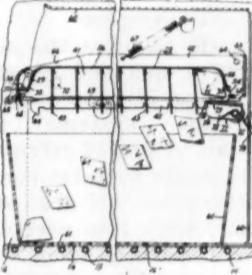
Printed copies of patents, reissued patents, and patent designs may be secured from the Patent Office; patents and reissues are 25¢ each, while designs are furnished at 10¢ each. Address orders to: Commissioner of Patents, Washington 25, D. C.

2,808,707. ICE MAKING APPARATUS. Thomas B. Chace, Winnetka, Ill., assignor to The Dole Valve Co., Chicago, Ill.

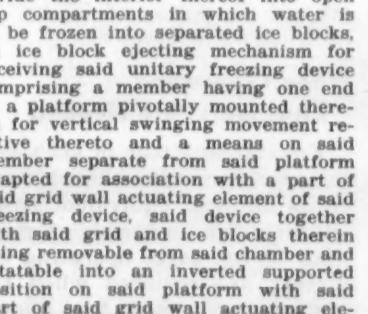


1. In an automatic ice block maker, an ice block mold, a thermal element for ejecting ice blocks from said mold, said thermal element comprising a casing containing a fusible material and a piston extensibly movable with respect to said casing upon fusion of the fusible material therein, an ejector arm on said mold operated adjacent one end by relative movement between said casing and piston, and means heating said thermal element to effect relative movement between said casing and piston and operate said ejector arm to eject ice blocks from the mold, the end of said ejector arm adjacent said thermal element having an arc of movement substantially parallel to the line joining the axis of rotation and the pivot of the link when the plug is in closed position.

2,808,708. ICE BLOCK EJECTING DEVICE. Verlos G. Sharpe, Dayton, Ohio, assignor to General Motors Corp., Detroit, Mich.



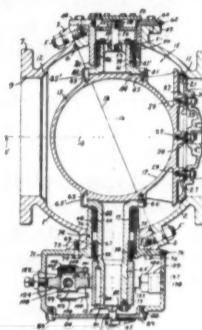
1. In combination, a refrigerator cabinet having a chamber therein, a refrigerating system associated with said cabinet including an evaporator for cooling said chamber to a temperature below 32° F., a unitary freezing device normally disposed in said chamber and exposed to the below 32° F. temperature of said evaporator, said unitary freezing device including a tray and a grid locked therein against removal therefrom, said grid comprising a plurality of spaced apart substantially inflexible walls inclined with respect to the vertical and a grid wall actuating element extending across said plurality of inclined walls adapted to engage and move same, said grid walls being anchored within said tray for tilting movement relative thereto and cooperating therewith to divide the interior thereof into open top compartments in which water is to be frozen into separated ice blocks, an ice block ejecting mechanism for receiving said unitary freezing device comprising a member having one end of a platform pivotally mounted thereon for vertical swinging movement relative thereto and a means on said member separate from said platform adapted for association with a part of said grid wall actuating element of said freezing device, said device together with said grid and ice blocks therein being removable from said chamber and rotatable into an inverted supported position on said platform with said part of said grid wall actuating ele-



GET YOUR COPY...  
See Order Form In This Issue

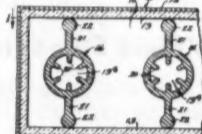
ment registering with said means on said member, said platform and said freezing device thereon being swingable about said pivotal mounting to cause said means on said member to engage said part of said actuating element and apply force thereto for shifting said element relative to the tray of said device, and the shifting of said actuating element tilting said inclined grid walls with respect to said tray toward the vertical for ejecting ice blocks downwardly out of the open top of the compartments in said inverted freezing device while the grid walls remain locked in the tray thereof.

2,809,011. VALVE STRUCTURE HAVING SPHERICAL SEATS. David Goldberg Davis, Beverly Hills, Calif.



4. In a valve structure: a valve body having an inlet port and an outlet port; a ported plug in the body, rotatable about an axis; means providing a seat around one of the ports in the body; means providing a seat on the plug mating with said seat of said body when said plug is in closed position, the seat surfaces being substantially spherical, and the center of curvature of the surfaces being respectively offset from the axis of the plug; and a mechanism for rotating said plug, comprising an arm fixed to the plug, a link pivoted at one end to the arm, and means for moving the link in a direction that is substantially parallel to the line joining the axis of rotation and the pivot of the link when the plug is in closed position.

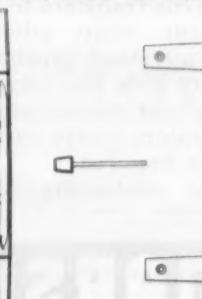
2,809,019. COOLING APPARATUS. Alwin B. Newton, Wichita, Kans., assignor to The Coleman Co., Inc., Wichita, Kans., a corporation of Kansas.



1. In a heat exchanger, an elongated and coiled conduit being provided with an internal flow passage therethrough and having a plurality of spaced-apart internal fins extending inwardly and longitudinally throughout said passage, said conduit also being provided with two pairs of diametrically opposing external fins extending laterally and longitudinally along said conduit, a container providing a chamber for receiving said conduit therein and being provided with an inner wall covered with a resilient lining, one of said pairs of external fins extending vertically to sealingly engage the resilient lining of said container and the other of said pairs of external fins extending horizontally for sealing engagement with the adjacent portions of said conduit for providing a pair of circuitous external flow passages between said conduit and the inner wall of said container, said container being provided with an inlet and an outlet for each of said internal and external flow passages.

### DESIGNS

181,119. REFRIGERATOR HANDLE. Harold S. Boutin, Curtice, Ohio, assignor to Revco Inc., Dearfield, Mich., a corporation of Michigan. Application May 13, 1957, Serial No. 46,127.



(To Be Continued)

### SEND FOR REPRINTS

Product Knowledge, Protective Maintenance, Trouble-Shooting, Adjustment, Repair of Electric Motors.

Only 40¢ each.

For your copy, clip this ad and mail with name and address to: Air Conditioning & Refrigeration News, 450 W. Fort, Detroit 26, Mich.

# Design and Operation of Low Voltage Thermostats

## 7. Operation of Room Thermostats

By Douglas S. Sterner, Sales Manager, Air Conditioning & Refrigeration Controls Div., General Controls Co.

### GENERAL THERMOSTAT INFORMATION

There are a few things of general information regarding room thermostats which may be of interest:

#### DIAL SETTINGS

The dial setting or "set" temperature of our heating thermostats is the temperature at which the thermostat will *make* its control circuit to bring "on" the heating system. The thermostat will normally break the heating circuit when the room air temperature rises 1° F. above the "set" temperature.

Thus, the "set" temperature of the heating room thermostat is the **MAKE** temperature of the thermostat and should be the minimum temperature of the conditioned space.

The operation of the *cooling* thermostat is different. The dial setting or "set" temperature of the cooling thermostat is the temperature at which the thermostat will *break* the control circuit.

The thermostat will normally *make* the cooling circuit when the room air temperature is 1° F. above the "set" temperature of the thermostat. The "set" temperature of the cooling thermostat is the **BREAK** point of the thermostat and controls the minimum room temperature.

#### CHANGING ANTICIPATORS

The correct heat anticipator must be selected in accordance with the thermostat manufacturer's table if the anticipator is of the "fixed" type. Changing is quick and easy. All that is necessary to do is to remove the screw which holds the heat anticipator to the base, change the anticipator, and put the screw back.

"Adjustable" heat anticipators simply require the correct positioning of the slider on the resistor. This should be, naturally, in accordance with the manufacturer's recommendations for the primary controls of the specific system.

**Glo-Brite Assures K Factor .23 Permanent — No Shrinkage**



FOAM PLASTIC AIR CONDITIONER TRAY

Low temperature insulation parts, molded precisely to your specifications. No moisture absorption.

**glo-brite** PRODUCTS  
6415 N. CALIFORNIA AVE.  
CHICAGO 45, ILLINOIS  
Wire or Phone RO 1-4045

"C" Auxiliary or supplementary connection for circuits where a second wire is required to control a function.

These identify the function by a code letter which can be easily understood by installation mechanics.

And there we have the low voltage room thermostat! The most widely used automatic control in the country. It is simple yet complex; sensitive yet rugged. When properly installed, it will provide years of faithful service, maintaining comfortable conditions in your home day and night, summer and winter.

(The End)

#### INSTALLATION AND INSPECTION HINTS

By now it should be obvious that the room thermostat is a rather complicated piece of precision control equipment, and as is the case for any such equipment, certain important things should be remembered when installing and inspecting room thermostats to assure that they operate to maintain the degree of comfort of which they are capable. It might be well to mention a few of the more important considerations:

1. Be sure that mercury switch thermostats are level when installed. Use a spirit level to check.

2. Locate the thermostat  
a. In a room with a cooling and/or a heating supply in it.  
b. Where it will be exposed to normal air circulation.

c. Where it is not subjected to the artificial effects of internal heat or cold such as TV sets, lamps, direct sun, cold air return, etc.

3. Be sure that the correct heat anticipator is installed in accordance with the recommendations of the manufacturer.

4. Be sure that all wires between the thermostat and the cooling and/or heating systems are firmly connected at the thermostat and that any splices (which should be held to a minimum) are made with clean wire tightly connected. Soldered splices are desirable.

5. The use of color coded thermostat cable (No. 19 or larger) is urged. As we have seen the control circuits between the room thermostat and the air conditioning system have become rather complicated and the use of cable with each conductor having a different color insulation reduces the possibility of incorrect wiring.

6. When wiring between the room thermostat and a control panel, remember to wire from *function* to *function*. Thus "C" at the thermostat and "C" in the panel both indicate the *cooling* function and should be wired together with a wire of the same color code.

Of general interest may be this basic function letter code:

#### Low Voltage Wire and Terminal Code

- "C" Cooling
- "D" Damper Motor—constantly energized in cooling
- "F" Fan (or blower)
- "H" Heating
- "M" 24 Volt supply (HOT) for clock motor or other required second power supply
- "R" Remote reset
- "V" 24 Volt supply (HOT)
- "X" Cooling, second stage
- "Y" Heating, second stage

## Comstock Named Chief Engineer at Heat-X; Gardner Also Named

WEST HARTFORD, Conn.—Russell E. Comstock has been appointed chief engineer of

Heat-X, Inc., a subsidiary of Dunham-Bush, Inc., and Richard Gardner application engineer at the Brewster, N. Y. plant of Heat-X.

Comstock comes from the Brunner Co. of Gainesville, Ga., Dunham-Bush subsidiary, where he was assistant chief engineer. Graduated from Clarkson College of Technology.

He is a member of American Society of Refrigerating Engineers.

Gardner has been employed in the sales department of Worthington Corp. A graduate of Agriculture & Technical Institute of the State University of New York, he also is an ASRE member.

## White-Rodgers Elects Sherer Vice President

ST. LOUIS—The board of directors of White-Rodgers Co., manufacturer, announced the election of Russell A. Sherer to the position of vice president.

Sherer, previously sales manager of White-Rodgers, will continue to direct all sales activities in addition to his new executive duties.

He became affiliated with White-Rodgers in 1943 after extensive experience in sales and sales management. Prior to assumption of his sales managerial duties in 1953, Sherer had responsibility for the company activities in the Chicago region.

#### For Your Reprint Copy

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning & Refrigeration News, 450 W. Fort, Detroit 26, Mich. Only 25¢ each.

## JUST PUBLISHED!—23rd EDITION



**1958 EDITION**

**AIR CONDITIONING AND REFRIGERATION DIRECTORY**

MORE PAGES

MORE NAMES

MORE SECTIONS

MORE PRODUCTS

including

MANUFACTURERS'

TRADE NAME

LISTINGS

**ORDER TODAY!**

#### COMPLETE UP-TO-THE-MINUTE LISTINGS

Alphabetic Lists

Air Conditioning

Trade Names

Commercial Refrigeration

Geographic Lists

Parts & Materials

Wholesalers

Supplies & Services

Exporters

Associations

Business News Publishing Co.

450 W. Fort St., Detroit 26, Mich.

Send me the new 1958 Air Conditioning & Refrigeration Directory.

1 Copy @ \$1.00  5 copies only \$4.00

Postage pre-paid if remittance accompanies order.

Name

Company

Address

City

Zone State

## Thompson Retires After 25 Years With Du Pont

WILMINGTON, Del.—Robert J. Thompson, one of the nation's pioneer refrigeration engineers, retires at the end of the month after more than 25 years with the du Pont Co., the last nine years of which he has been director of sales for its "Freon" Products Div.

Thompson's career in refrigeration has spanned nearly 40 years, beginning with General Motors Corp.'s program for development of household and commercial electric refrigerators in the early 1920's. He took part in the development, engineering adaptation, commercial introduction, and sale of "Freon" refrigerants.

## Hotpoint Sets Prices On Built-In Models

CHICAGO—Hotpoint Co. has announced recommended national retail prices on its 1958 "Customline" (built-in) refrigerators and freezers. Model numbers and prices are:

7CBQ11, intermediate 10.8-cu. ft. refrigerators (coppertone), \$415.

7CB-11, intermediate 10.8-cu. ft. refrigerator (colortones), \$390.

7CHC12, deluxe 12.2-cu. ft. combination refrigerator (stainless steel), \$610.

7CHQ12, deluxe 12.2-cu. ft. combination refrigerator (coppertone), \$550.

7CH-12, deluxe 12.2-cu. ft. combination refrigerator (colortones), \$525.

7CMC12, deluxe 11.9-cu. ft. vertical freezer, (stainless steel), \$535.

7CMQ12, deluxe 11.9-cu. ft. vertical freezer (coppertone), \$480.

7CM-12, deluxe 11.9-cu. ft. vertical freezer (colortones), \$455.

Hotpoint said that suggested retail prices would prevail on its lines of television, Customline appliances, and home laundry equipment.

However, prices for ranges, refrigerators, food freezers, air conditioners, dishwashers, water heaters, food waste disposers, will carry no recommended retail prices. Prices for these appliances will be suggested by distributors to make them competitive in given markets, the company said.

## Thomas, Paine Upped By Bendix-Westinghouse

ELYRIA, Ohio—Election of D. O. Thomas as chairman of the board of directors of Bendix-Westinghouse Automotive Air Brake Co. and Willard B. Paine as president and chief executive officer was announced here.

Thomas has served as president of Bendix-Westinghouse since 1942. Paine was named executive vice president of Bendix-Westinghouse last May.

### For Your Reprint Copy

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning & Refrigeration News, 450 W. Fort, Detroit 26, Mich. Only 25¢ each.

## 'Summit-Level' Advisory Council

## So. Calif. Group Will Create Opportunities for Heating, Cooling

LOS ANGELES—A "summit-level" advisory council of key executives, said to be the first of its kind in the nation, was created here recently "to provide top leadership and create new opportunities for Southern California's 150 million dollar heating and air conditioning industry in a period of growing emphasis on air purification and improved indoor climate."

The announcement was made by Randall M. Snow, newly-appointed managing director of the Institute of Heating and Air Conditioning Industries which co-sponsored "the first U.S. conference on indoor climate design" with the UCLA School of Engineering last fall.

Snow said the Institute Advisory Council will serve a three-fold purpose—creation of market opportunities through advertising and public relations, integration of research and design with field experience at the public level, and constant improvement of techniques and standards. It will consist of the following:

W. J. Bailey, president, Day & Night Mfg. Co., and the Payne Co.; Ben B. Breslow, president of Utility Appliance Corp., Mission Appliance Corp., and Gaffers and Sattler; F. M. Foster, vice president, sales, advertising, and public relations, Southern California Gas Co.; William A. Ray, president, Gen-

eral Controls Co.; Donald S. Will, president, Southland Heating & Air Conditioning, Inc., a contracting firm.

The institute advisors will serve indefinitely, meet with officers of the IHACI as industry opportunities or problems require, and deal only with top policy matters.

Snow said the Institute Advisory Council will enable the industry to do these three things:

1. Take fullest advantage of existing opportunities and create new ones "in the nation's leading market for indoor climate equipment."

2. Insure greatest possible integration of laboratory and design advances with practical field experience of contractors and other industry members.

3. Guarantee that research and development progress is passed on to the public in the quickest possible time through improved techniques and in code

standards of counties and municipalities.

Snow said top level industry leadership is of vital importance both to industry, the public, and public officials "at a time when vigorous efforts are being made to improve indoor climate design in the face of man-made air pollution and growing knowledge that such design is vital productivity of business and industry."

The IHACI is an industry-wide association of manufacturers, suppliers, and contractors that for years has concerned itself with promotion of highest industry aims in technical standards, consumer safeguards through improved building requirements, and market expansion.

The Advisory Council, Snow added, is the first regional group of its kind to be formed by the industry anywhere in the U.S. and may well set a pattern for other areas.

## HERE'S THE WINNER! OF THE MUELLER BRASS CO. DRYMASTER "HI-FI" CONTEST AT THE A.R.I. SHOW



Nip Mohler (left) receives the Webcor high-fidelity console and congratulations from Ed Joern (right) manager of the Mueller Brass Co. St. Louis sales office.

At the highly successful 10th Exposition of the Air Conditioning and Refrigeration Industry held in Chicago in November, the Mueller Brass Co. "Out of This World" Display and the Drymaster "Hi-Fi" Contest attracted unusual attention. Those of you who attended the show, and who entered the contest will remember that you had to guess the combined capacity, in drops of water, of all the filter-blocks contained in the king-size Drymaster Filter-Drier. Our thanks to all who entered and congratulations to the winner—

NIP MOHLER, R. E. THOMPSON COMPANY

1532 TOWER GROVE AVE., ST. LOUIS, MISSOURI

View of the Mueller Brass Co. exhibit at the show with two attractive visitors from "Outer Space".



**MUELLER BRASS CO.**

PORT HURON 13, MICHIGAN